

# **Focused Field Investigation Phase II Groundwater Report**

**Marzone Superfund Site  
Tifton, Georgia**

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Prepared for

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# Acronyms and Abbreviations

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|         |  |
|---------|--|
| b       | saturated thickness                    |
| bls     | below land surface                     |
| CompQAP | Comprehensive Quality Assurance Plan   |
| COD     | chemical oxygen demand                 |
| d       | day                                    |
| EPA     | Environmental Protection Agency        |
| EPA     | U.S. Environmental Protection Agency   |
| FFI     | Focused Field Investigation            |
| ft/d    | feet per day                           |
| GC      | gas chromatography                     |
| gpd/ft  | gallons per day per foot               |
| gpm     | gallons per minute                     |
| gpm/ft  | gallons per minute per foot            |
| HPLC    | high performance liquid chromatography |
| I       | hydraulic gradient                     |
| K       | hydraulic conductivity                 |
| MCL     | maximum contaminant level              |
| mg/L    | milligrams per liter                   |
| mL      | milliliter                             |
| MS      | mass spectrometry                      |
| $n_e$   | effective porosity                     |
| PAHs    | polynuclear aromatic hydrocarbons      |
| PCBs    | polychlorinated biphenyls              |
| psi     | pounds per square inch                 |
| PVC     | polyvinyl chloride                     |
| RD/RA   | remedial design/remedial action        |
| ROD     | record of decision                     |

## Acronyms and Abbreviations, Continued

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|      |                                |
|------|--------------------------------|
| SVOC | semivolatile organic compounds |
| SW   | solid waste                    |
| T    | transmissivity                 |
| toc  | top of well casing             |
| TOC  | total organic carbon           |
| TDS  | total dissolved solids         |
| TSS  | total suspended solids         |
| VOC  | volatile organic compounds     |

**SECTION 1**

# Introduction

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## Background

This Focused Field Investigation (FFI) Phase II Groundwater Report presents the results of the completion of an aquifer test, well abandonment, and residential groundwater monitoring at or in the vicinity of the Marzone Superfund Site near Tifton, Georgia. It begins with a brief summary of site and regional hydrogeology to help orient the reader. This FFI was conducted to provide additional data to support the remedial design/remedial action (RD/RA) phase of the project. The Phase II FFI field work was completed from March 11 through March 24, 1996.

The aquifer test was conducted to collect site-specific information on aquifer characteristics. Groundwater discharge samples collected during the aquifer test can be used for preliminary design of a groundwater treatment system. Drawdown data collected during the aquifer test can provide information necessary to determine the aquifer hydraulic characteristics required for modeling of the groundwater system or for preliminary design of a pump-and-treat system. These data can also be used to determine well spacings, pumping rates, and estimates of pumping well capture zones.

The work described in this report was developed by the Marzone project team in a series of team meetings and conference calls during January and February 1996. A team conference call also was held on March 18, 1996, during the field event, to discuss potential changes to the work plan based on the field work completed prior to that date. The team was formed in September 1995 to implement the RD/RA activities for the Marzone site on an accelerated schedule and includes staff from the following entities:

- Chevron Chemical Company
- Chevron Research and Technology Company
- CH2M HILL
- U.S. Environmental Protection Agency (EPA) Region IV
- Georgia Department of Natural Resources
- Focus Environmental
- Geomega
- Environmental Communications Solutions
- Planners for Environmental Quality
- CDM Federal Programs

The Quality Assurance Project Plan, Health and Safety Plan, Comprehensive Quality Assurance Plan (CompQAP), and relevant field procedures included in the Focused Field Investigation (Phase I) Project Work Plan (CH2M HILL, 1995) were used in executing this work.

## Summary of Site Hydrogeology

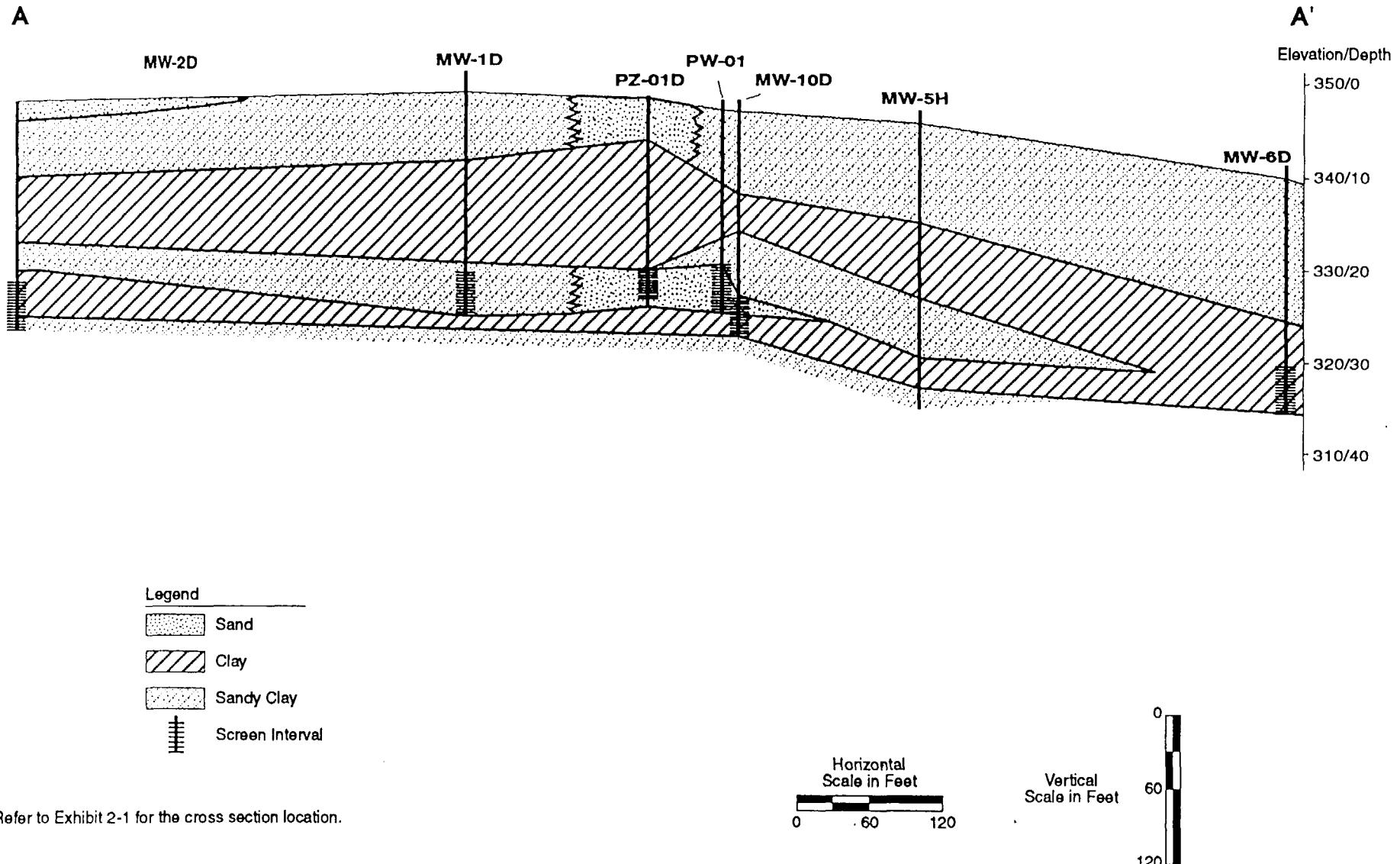
Site and regional hydrogeology are characterized in detail in the Remedial Investigation Report (Brown and Caldwell, 1992) and earlier documents relating to the Marzone site. This section briefly summarizes shallow hydrogeology for the site to clarify discussion of the activities being performed during this work phase.

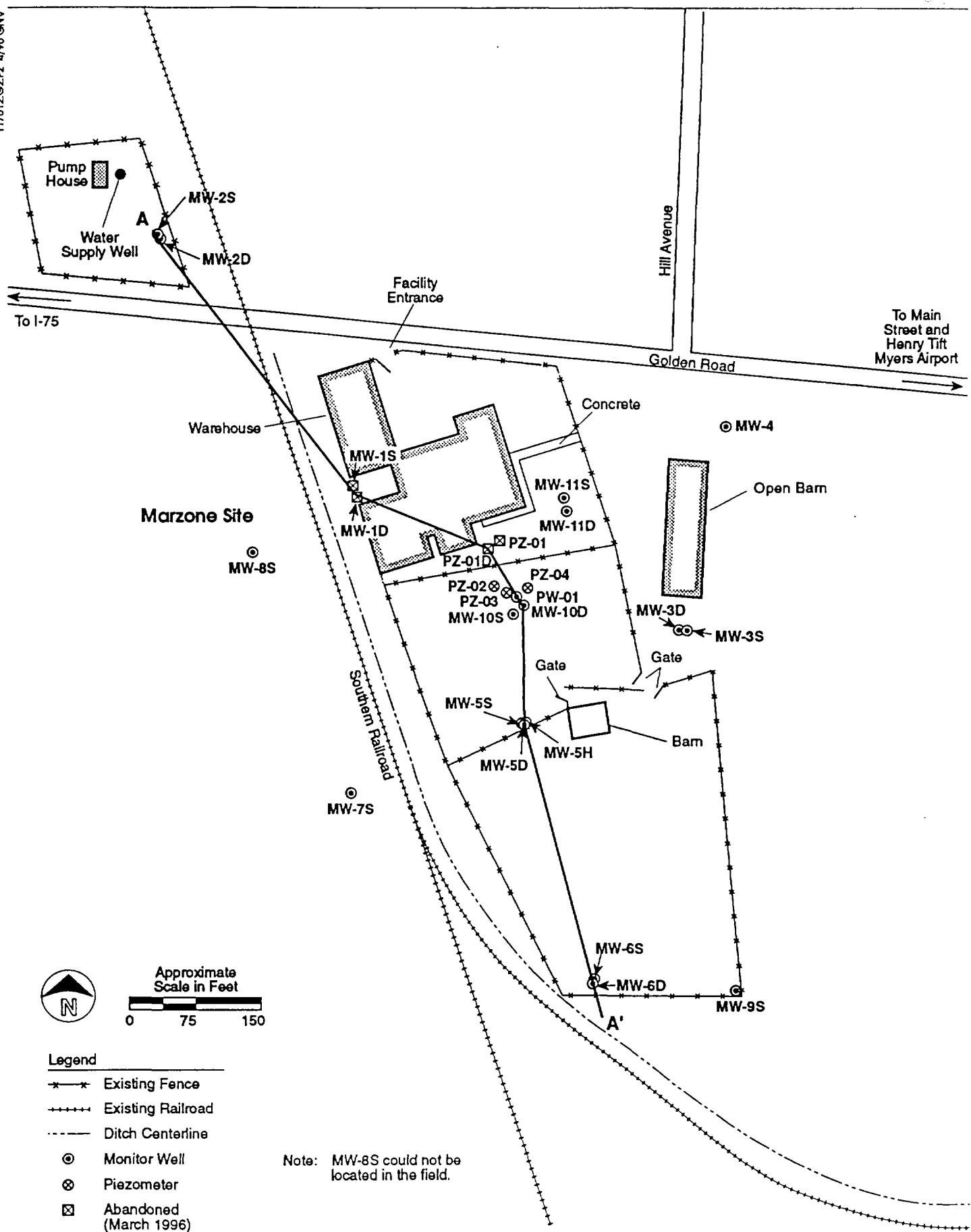
The uppermost geologic unit at the site is the Miocene age Hawthorn Formation, which is a confining unit for the underlying limestone formation. The Hawthorn Formation occurs near ground surface at the site and extends in some areas to a depth of approximately 300 feet below land surface (bls). The Hawthorn Formation is composed primarily of interbedded clays and similar fine-grained materials of limited permeability. These soils promote runoff while limiting infiltration.

Because it is primarily fine-grained, the Hawthorn Formation contains numerous perched or ephemeral (seasonal) accumulations of water. These shallow water-bearing zones may occur separately, merge, or pinch out completely within short lateral distances across the site.

The cross section in Exhibit 1-1 depicts the generalized site geology (predominantly clay) from lithologic descriptions of subsurface soil samples collected during installation of the monitor wells and piezometers. The location of the cross section appears in Exhibit 1-2. As shown in Exhibit 1-1, a thin sand interval occurs between about 18 and 21 feet bls at PZ-01D, between 16 and 21 feet bls at PW-01, and between about 20 and 20.5 feet bls at MW-10D. This sand interval is also evident at MW-11D between approximately 19 and 21 feet bls, and at PZ-02 between 20 and 22 feet bls. To recover groundwater at the highest rate possible, the aquifer test well (PZ-03), was open to this sand interval. Each of the observation wells (PZ-02, PZ-04, and PW-01) installed during this field investigation was also open to the sand interval.

## Marzone Site





**Exhibit 1-2**  
Location of the Geologic Cross Section

## SECTION 2

## Aquifer Test Well and Observation Well Construction

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One aquifer test well and three observation wells were installed on the property just south of the Marzone property (Exhibit 2-1). The water rotary method was used to drill the borehole for each of these wells. The water supplied to the borehole mixed with the clay lithology and created a natural mud which allowed the borehole to remain open and removed the borehole cuttings. With the exception of the first well (PZ-02), natural mud and solids were removed from the circulation system and water added prior to drilling the sand interval of each borehole.

PZ-03, the aquifer test well, was constructed of 2-inch-diameter stainless steel casing to a depth of about 22 feet below land surface (bls) and screened between 17 and 22 feet. A stainless steel screen of 0.010-slot was used. Split spoon samples were collected in the screened interval and analyzed by the sieve method. The sieve analyses results are provided in Appendix A.

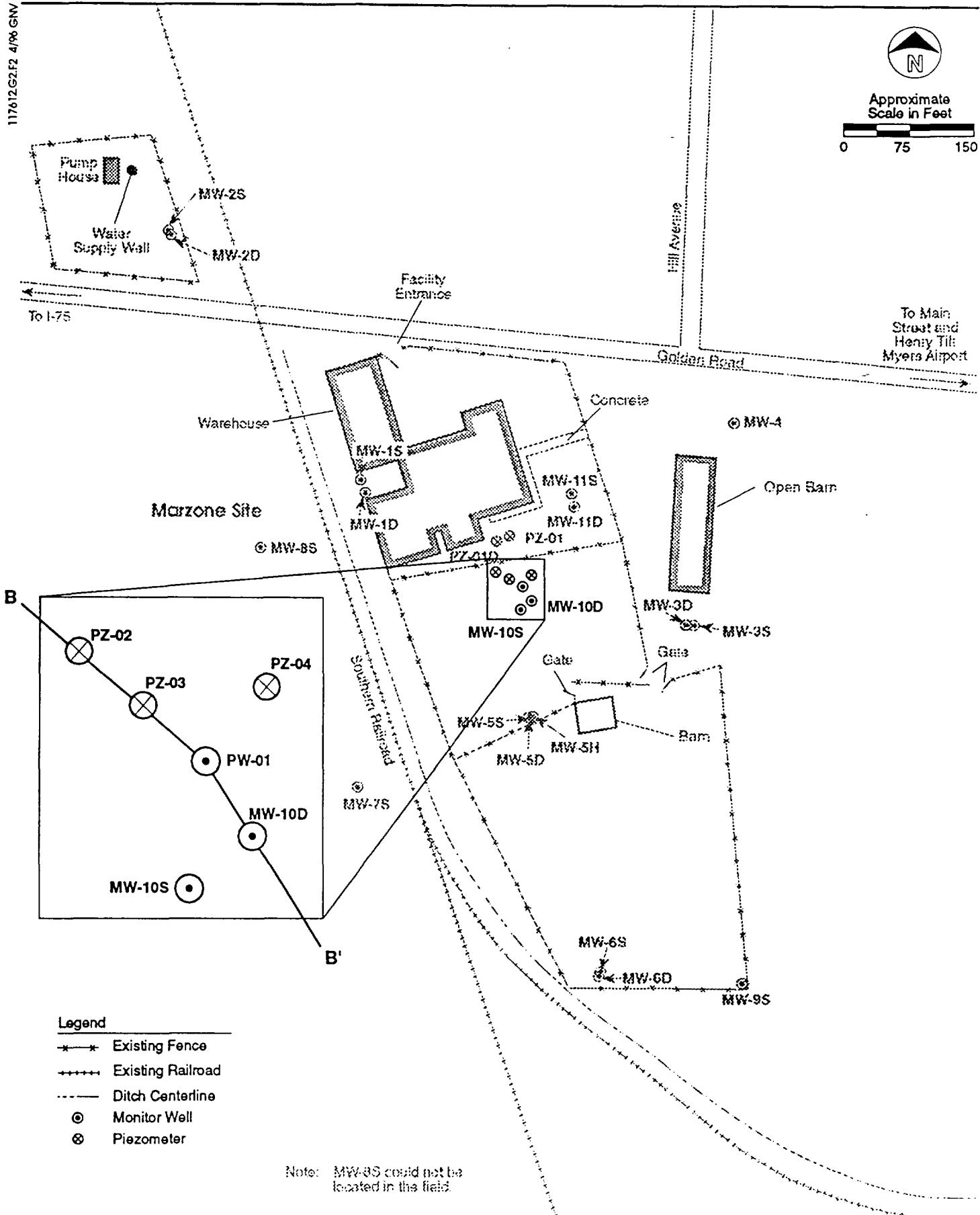
The three observation wells installed (PZ-02, PZ-04, and PW-01) were constructed of 2-inch-diameter stainless steel casing and screen. Split spoon samples were collected in the screened intervals and analyzed by the sieve method (Appendix A). The observation wells incorporate a 5-foot length of 0.010-slot screen between 16 and 23 feet, approximately. A cross section of the pumping well and three observation wells is shown in Exhibit 2-2. The soil boring logs for the four wells installed in this phase are provided in Appendix B, and the monitor well completion forms for each well are provided in Appendix C.

After the wells were installed, each was developed for approximately 3 hours with a 2-inch diameter surge block and pumped with a centrifugal pump, intermittently, until the water was clear and free of any visible fines. After the wells were developed, test pumping was performed to determine the discharge rate from each well. Test pumping durations ranged from 30 minutes to 3 hours.

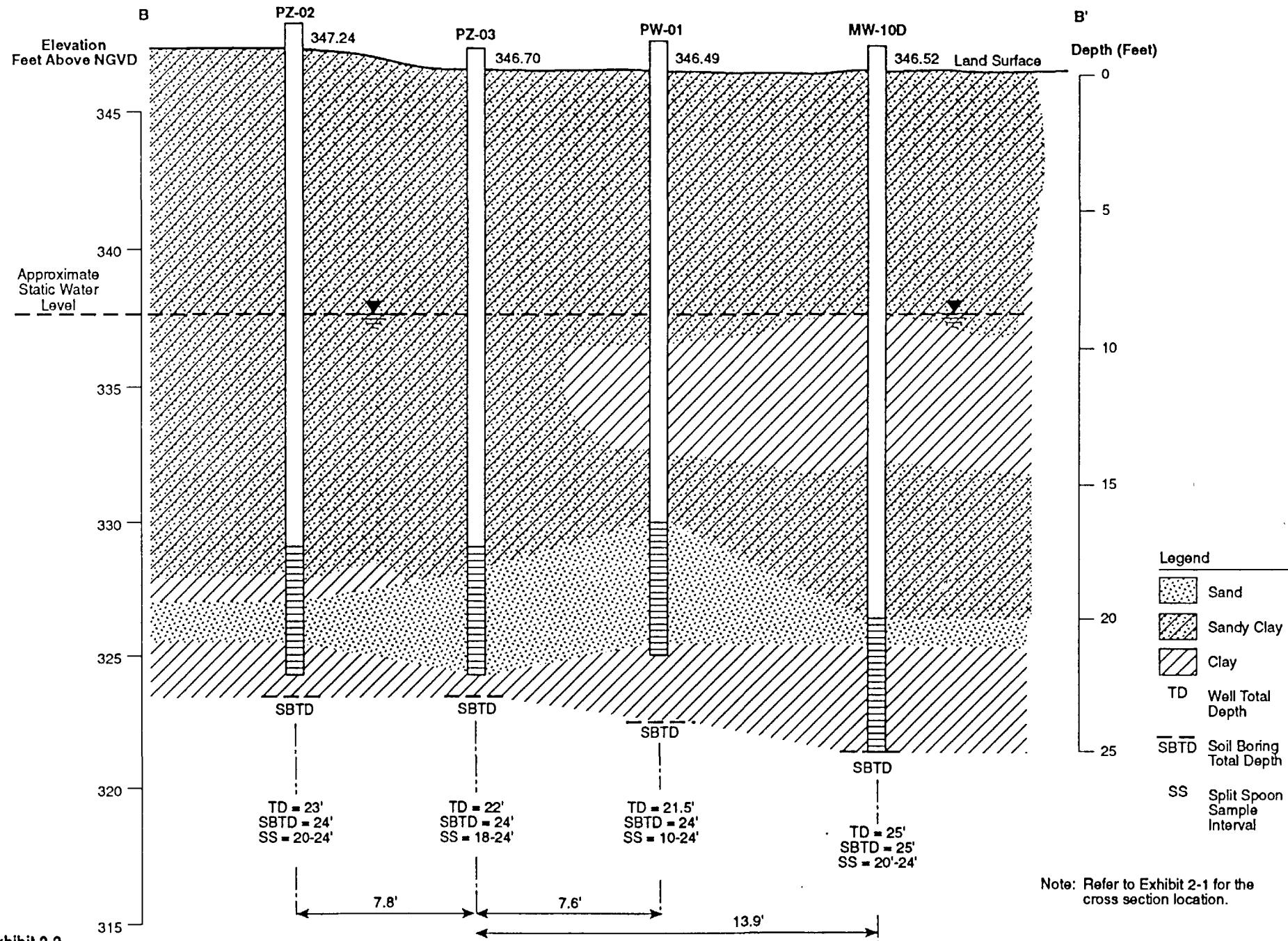
Initially, PW-01 was to be the pumping well. During development and test pumping, it was evident that PW-01 was producing water at a specific capacity approximately half that of the other wells. Exhibit 2-3 provides the results from the test pumping. The Marzone project team determined during its conference call on March 18, 1996, that using PW-03 as the aquifer test well would provide data more representative of the hydraulic characteristics in this area in the geologic strata of interest.



Approximate Scale in Feet



**Exhibit 2-1**  
Aquifer Test Well Installation Layout



2-3

**Exhibit 2-2**

Generalized Geologic Cross Section at the Aquifer Test Location

**CH2MHILL**

EXHIBIT 2-3  
Test Pumping Results  
March 16, 1996

| Well Number | Discharge Rate<br>(gpm) | Drawdown<br>(ft) | Specific Capacity<br>(gpm/ft) |
|-------------|-------------------------|------------------|-------------------------------|
| PW-01       | 0.2                     | 4.9              | 0.04                          |
| PZ-02       | 0.9                     | 9.2              | 0.10                          |
| PZ-03       | 1.5                     | 11.1             | 0.13                          |
| PZ-04       | 0.2                     | 2.1              | 0.09                          |

**SECTION 3**

# **Aquifer Testing**

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## **Step Test**

Three days before the step test was begun, a pressure transducer was placed into well PZ-02 to record background water level data. The step test was performed on Tuesday, March 19, 1996, using four separate pumping rates over an 8-hour period. PZ-03 was the pumping well. The four discharge rates (pumping rates) used were 0.35, 0.66, 1.0, and 1.4 gallons per minute (gpm). Recovery data were also collected at the end of the test for a period of 2 hours. The specific capacity values determined from the step test ranged from 0.15 to 0.12 gpm/foot of drawdown. The pumping rate and water level drawdown data collected during the step test were used to estimate the maximum sustainable pumping rate for the 72-hour aquifer test. The step test data was analyzed by the Theis method with corrected drawdown for an unconfined aquifer. A transmissivity value of 534 gallons per day per foot (gpd/ft) was calculated. This value is very comparable with the aquifer test results discussed in the next section. The step test results are provided in Appendix D. Step test water level data are provided on diskette in Appendix E.

## **Aquifer Test Procedure**

Based on the results of the step test, a pumping rate of 1.0 gpm was selected for the aquifer test. This rate was estimated to provide enough stress on the formation to cause a measurable decline in the water level in the observation wells, but not to cause the water level in the pumping well to decline to a level equal to the pump intake.

A Grundfos stainless steel submersible pump was used. The pump intake was placed directly above the top of the screen at a depth of 19.15 feet from top of well casing (toc). This placement allowed approximately 13 feet of available drawdown in the pumping well while maintaining horizontal flow within the sand interval.

Prior to the start of the aquifer test, an additional pressure transducer was installed in monitor well MW-6D (Exhibit 1-2). This well was used to monitor background water levels during the aquifer test and recovery phase.

The aquifer test began on Wednesday, March 20, 1996, at 12:30 p.m., with a pumping rate of 1 gpm. The discharge rate was continuously measured with an in-line vertical flow meter and an in-line residential turbine flow meter. The rate also was measured at the point of discharge using a 500-milliliter (mL) graduated cylinder. The pumping rate was recorded periodically during the aquifer test.

Three new wells, PW-01, PZ-02, and PZ-04, and four existing wells, MW-5D, MW-10S, MW-10D, and MW-11D, served as observation wells for water level measurements during the aquifer test. Soil boring logs for the background well (MW-6D) and these wells are provided in Appendix B. Monitor well completion forms are provided in Appendix C.

Water level measurements were recorded by pressure transducers installed into PW-01, PZ-02, PZ-04, MW-5D, MW-10S and MW-10D, and water level measurements were periodically collected by hand from well MW-11D. Barometric pressure and rainfall were measured during the aquifer test. Zero rainfall occurred during the step test, aquifer test, and recovery. Barometric pressure was measured with a pressure transducer and checked with barometric pressure readings from the local airport located approximately 1 mile away. A graph of the barometric pressure data is included in Appendix F. Water levels in the background well indicate little or no change due to variations of barometric pressure.

Approximately 52 hours into the test, the drawdown reached a critical level within PZ-03 and the discharge rate was adjusted down to 0.6 gpm. This discharge rate was held constant for approximately 20 hours until the end of the 72-hour period. After the test, water level recovery data were collected for 21 hours. Water levels returned to within 0.8 feet from original static conditions.

Well efficiency for the pumping well (PZ-03) was calculated to be approximately 34 percent (Driscoll, 1986). This efficiency is typical for a small diameter well screened in a formation of low hydraulic conductivity.

## Aquifer Test Results

The computer program AQTESOLV, developed by Geraghty & Miller, Inc., was used to analyze the aquifer test data and to compute aquifer hydraulic characteristics, such as transmissivity and storativity. The aquifer parameter estimates were performed by the Theis curve-matching method (1934) for pumping and recovery and the Cooper-Jacob straight-line method (1946) for pumping only, both with a Jacob drawdown correction to account for unconfined conditions. The pumping well drawdown curve is shown in Exhibit 3-1. As evidence of unconfined conditions, note that the curve flattens after the initial drawdown, as the effects of gravity drainage and vertical flow cause deviations from the Theis curve. Toward the end of the test, the rate of drawdown increases again as the effects of gravity drainage become smaller (Fetter, 1988). Further evidence of unconfined conditions is represented by the drawdown of water level at MW-10S (Appendix F). The water level decline in this shallow well is very similar to the response in the adjacent deeper well (MW-10D), indicating good hydraulic connection between the shallow and deep monitoring zones at this location. As presented in Section 5, low hydraulic conductivity values from in situ hydraulic conductivity (SLUG) testing indicate that this hydraulic connection may not exist at locations throughout the site.

A summary of the aquifer test results is provided in Exhibit 3-2. The data analyses are provided in Appendix F. Water level data during the test are provided on diskette in Appendix E. The average transmissivity from all of the tests is 447 gpd/ft ( $60 \text{ ft}^2/\text{d}$ ).

The hydraulic conductivity (K) of the aquifer is calculated from the relationship:

$$K=T/b$$

where:       $T=\text{transmissivity } (60 \text{ ft}^2/\text{d})$   
                   $b=\text{saturated thickness } (19.17 \text{ ft})$

The average hydraulic conductivity is 3.1 ft/d. This value compares very close to the hydraulic conductivity slug test value of 4.6 ft/d from PZ-01D. PZ-01D (abandoned March 1996) was screened within the sand interval. Because the sandy layer is significantly coarser in grain size than the overlying saturated strata, the hydraulic conductivity of the sandy layer is almost certainly higher than that of the overlying formation. Assuming that all flow to the recovery well during the aquifer test originated in the sandy layer, the hydraulic conductivity of that layer could be as high as 20 ft/d. Because the test results indicated that the shallower zone responded well during the aquifer test, it is likely that the actual hydraulic conductivity of the sandy layer is between 3.1 and 20 ft/d.

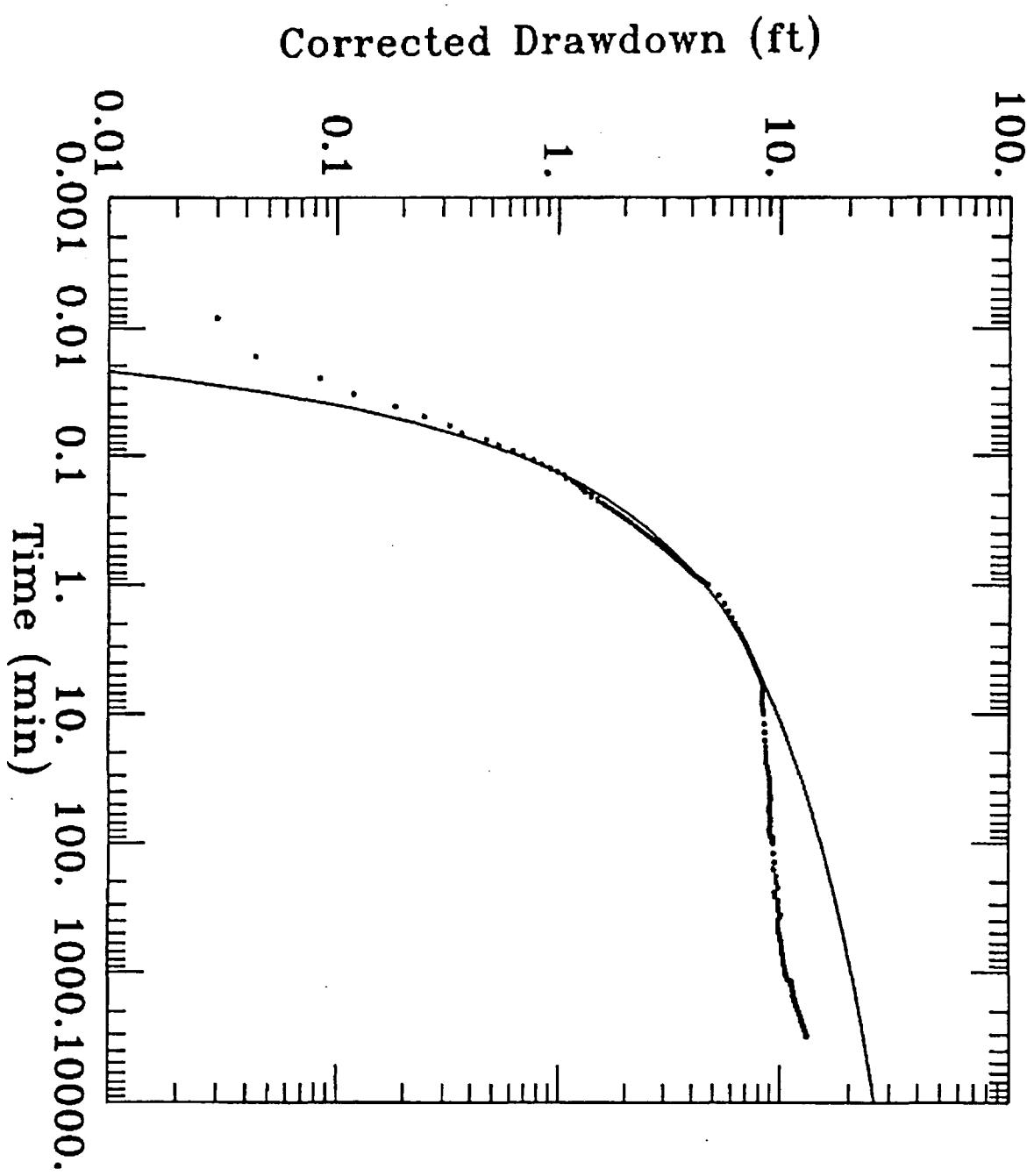


Exhibit 3-1  
Drawdown Curve for Pumping Well (PZ-03)

**EXHIBIT 3-2**  
**PZ-03 Aquifer Test Results**  
*March 19-24, 1996*

| <b>Analysis Well</b> | <b>Analysis Method</b> | <b>Transmissivity<br/>(gpd/ft)</b> | <b>Transmissivity<br/>(ft<sup>2</sup>/day)</b> | <b>Storativity</b> |
|----------------------|------------------------|------------------------------------|--|--------------------|
| PZ-02                | Theis                  | 562                                | 75   | 0.001              |
|                      | Cooper-Jacob           | 558                                | 75   | 0.001              |
|                      | Recovery (Theis)       | 424                                | 57   | 0.02               |
| PZ-04                | Theis                  | 505                                | 68   | 0.002              |
|                      | Cooper-Jacob           | 576                                | 77   | 0.001              |
|                      | Recovery (Theis)       | 395                                | 53   | 0.02               |
| PW-01                | Theis                  | 616                                | 82   | 0.004              |
|                      | Cooper-Jacob           | 645                                | 86   | 0.002              |
|                      | Recovery (Theis)       | 576                                | 77   | 0.01               |
| MW-5D                | Theis                  | 387                                | 52   | 0.001              |
|                      | Cooper-Jacob           | 370                                | 49   | 0.001              |
|                      | Recovery (Theis)       | 233                                | 31   | 0.002              |
| MW-10S               | Theis                  | 422                                | 56   | 0.01               |
|                      | Cooper-Jacob           | 457                                | 61   | 0.007              |
|                      | Recovery (Theis)       | 339                                | 45   | 0.04               |
| MW-10D               | Theis                  | 309                                | 41   | 0.02               |
|                      | Cooper-Jacob           | 319                                | 43   | 0.02               |
|                      | Recovery (Theis)       | 259                                | 35   | 0.06               |
| Step Test            | Theis                  | 534                                | 71   | ---                |
| <b>Averages</b>      |                        | <b>447</b>                         | <b>60</b>                                      | <b>0.012</b>       |

Aquifer: unconfined

## SECTION 4

# Sample Collection and Analysis

Samples of the discharge water were collected during the aquifer test and analyzed for the methods listed in Exhibit 4-1. One sample was collected near the beginning of the test (after sufficient well purging), a second sample was collected approximately 24 hours into the test, and a third sample was collected before the test was shut down for recovery. A data summary of the detected parameters is provided in Exhibit 4-2.

Field turbidity, conductivity, and pH measurements of the discharge water were also collected periodically during the aquifer test. Field water quality data are presented in Appendix F. The water produced during testing is stored onsite in a fractionation tank until the building demolition phase of site remediation, which is expected to begin in June 1996. The water will be treated and disposed of at that time. Water quality results are provided in Appendix G. A more comprehensive water quality sample will be collected and analyzed, particularly for major cations and anions, prior to the design of the potential groundwater recovery treatment system. This data will further define the potential implications of recovery water quality to a treatment system.

**EXHIBIT 4-1**  
Aquifer Test Sample Analysis Methods

| Analysis                          | Method(s)                           |
|-----------------------------------|-------------------------------------|
| GC VOCs                           | EPA SW 8010/8020                    |
| GC/MS SVOCs and pentachlorophenol | EPA SW 8270 and SW 8040             |
| PAHs                              | EPA SW 8310 (HPLC)                  |
| Pesticides/PCBs                   | EPA SW 8080                         |
| Methylparathion, atrazine         | EPA SW 8140                         |
| Iron (unfiltered)                 | EPA SW 6010                         |
| Manganese (unfiltered)            | EPA SW 6010                         |
| TSS, TDS, and pH                  | EPA 160.2, EPA 160.1, and EPA 150.1 |
| TOC                               | EPA 415.2                           |
| COD                               | EPA 410.1                           |

|      |   |   |
|------|---|---|
| COD  | = | Chemical oxygen demand.                 |
| EPA  | = | Environmental Protection Agency.        |
| GC   | = | Gas chromatography.                     |
| HPLC | = | High performance liquid chromatography. |
| MS   | = | Mass spectrometry.                      |
| PAHs | = | Polynuclear aromatic hydrocarbons.      |
| PCBs | = | Polychlorinated biphenyls.              |
| SVOC | = | Semivolatile organic compounds.         |
| SW   | = | Solid waste.                            |
| TDS  | = | Total dissolved solids.                 |
| TOC  | = | Total organic carbon.                   |
| TSS  | = | Total suspended solids.                 |
| VOC  | = | Volatile organic compounds.             |

**EXHIBIT 4-2**

## Detected Parameters in Aquifer Test Groundwater

| Parameters/Units           | Station ID<br>Sample ID<br>Collection Date<br>Collection Time<br>Elapsed Time | PZ03<br>MGC001<br>03/20/96<br>1235<br>20 minutes | PZ03<br>MGC003<br>03/21/96<br>1230<br>24 hours,<br>15 minutes | PZ03<br>MGC005<br>03/23/96<br>1215<br>72 hours |
|----------------------------|---|--|---|--|
| <b>Purgeable Aromatics</b> |   |  |   |  |
| Ethylbenzene               | mg/L  | = 5.3  | = 11  | = 6.5  |
| Toluene                    | mg/L  | U .5   | = .52   | U .5   |
| Xylenes, total             | mg/L  | = 36   | = 76  | = 46   |
| <b>Semivolatiles</b>       |   |  |   |  |
| Phenol                     | mg/L  | J .088   | J .078  | J .098   |
| 2,4-dichlorophenol         | mg/L  | U .2   | U .2  | J .021   |
| Naphthalene                | mg/L  | J .081   | J .1  | J .098   |
| 2-methylnaphthalene        | mg/L  | J .05  | J .054  | J .047   |
| 4-nitrophenol              | mg/L  | = 8.5  | = 6.8   | = 7.8  |
| <b>Pesticides</b>          |   |  |   |  |
| Alpha-BHC                  | mg/L  | = .0058  | = .0053   | = .0056  |
| Beta-BHC                   | mg/L  | = .0016  | J .0015   | = .0016  |
| Delta-BHC                  | mg/L  | = .0063  | = .0055   | = .0065  |
| Gamma-BHC (lindane)        | mg/L  | = .016   | = .014  | = .018   |
| 4,4'-DDD                   | mg/L  | J .0014  | U .0016   | U .0016  |
| 4,4'-DDT                   | mg/L  | J .0014  | U .0016   | U .0016  |
| Atrazine                   | mg/L  | = .08  | = .093  | = .081   |
| Parathion, methyl          | mg/L  | = .038   | = .045  | = .046   |
| PAHs                       |   |  |   | U .0016  |
| Naphthalene                | mg/L  | = .21  | = .19   | = .23  |
| Acenaphthylene             | mg/L  | = .027   | = .026  | = .027   |
| <b>Metals</b>              |   |  |   |  |
| Iron                       | mg/L  | = 30.7   | = 31.2  | = 31.8   |
| Manganese                  | mg/L  | = 46.4   | = 47  | = 49.5   |
| <b>General Chemistry</b>   |   |  |   |  |
| pH                         | pH Units  | J 4.7  | J 4.7   | J 4.7  |
| Total dissolved solids     | mg/L  | = 1030   | = 1010  | = 994  |
| Suspended solids           | mg/L  | < 4  | < 4   | < 4  |
| COD                        | mg/L  | = 375  | = 382   | = 389  |
| Total organic carbon       | mg/L  | = 30   | = 28.8  | = 40.6   |

=: Detected

J: Estimated - detected below reporting limit.

U: Not detected.

&lt;: Less than value shown

SECTION 5

## In Situ Hydraulic Conductivity Testing

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In-situ hydraulic conductivity (slug) tests were performed on selected shallow and deep monitor wells. The shallow wells tested included MW-1S, MW-3S, MW-4S, MW-5S, MW-6S, MW-7S, MW-9S and MW-11S. The deep monitor well tested included MW-1D, MW-3D, MW-6D, MW-11D, and PZ-01D. The locations of the selected wells can be seen in Exhibit 1-2. The static depth to water and total depth of the wells were measured before completing the slug tests.

The first step in the slug test procedure was to place a 10-psi pressure transducer in the well and secure it to the side of the well casing. The transducer cable was then connected to a data logger which is programmed to measure and record water levels during the slug test. The transducer was typically positioned approximately 1 foot from the bottom of the well.

Once the setup was complete, the data logger was started, and a 1-inch-diameter by 5-foot-long PVC slug was quickly lowered into the monitor well. The rise and decline of the water level was then recorded as a "slug in" test and observed until the approximate original water elevation was reached. The data logger was reset, and a "slug out" test was started. This time, the slug was quickly removed from the well, causing the water level to drop rapidly. The data logger measured and recorded the recovery of the water level in the well until the approximate pretest groundwater elevation was reached.

To determine hydraulic conductivity, slug test data were analyzed using the method described by Bouwer and Rice (1976) and Bouwer (1989). The slug test hydraulic conductivity for the shallow wells ranged from 0.006 to 2.9 ft/day (d) and for the deep wells ranged from 0.0017 to 4.6 ft/d. Slug test results are presented in Exhibit 5-1. The hydraulic conductivity value of 4.6 ft/d was from PZ-01D, which is completed in the same zone as the aquifer test wells. This value is similar to the average hydraulic conductivity value of 3.1 ft/d obtained from analysis of the aquifer test data. The slug test results are provided in Appendix H. Slug test water level data are provided on diskette in Appendix E.

**EXHIBIT 5-1**  
Slug Test Results  
March 11-15, 1996

| Well            | Well Depth | Hydraulic Conductivity<br>(ft/d) |
|-----------------|------------|----------------------------------|
| <b>Shallow:</b> |            |                                  |
| MW-1S           | 12.7       | 0.006                            |
| MW-3S           | 13         | 0.152                            |
| MW-4S           | 12         | 0.11                             |
| MW-5S           | 12         | 0.60                             |
| MW-6S           | 12.8       | 0.64                             |
| MW-7S           | 15.3       | 0.55                             |
| MW-9S           | 12.6       | 2.9                              |
| MW-11S          | 17.7       | 0.049                            |
| <b>Deep:</b>    |            |                                  |
| MW-1D           | 27.8       | 0.46                             |
| MW-3D           | 27.6       | 1.3                              |
| MW-6D           | 27.7       | 0.0017                           |
| MW-11D          | 27         | 0.11                             |
| PZ0-1D          | 22.8       | 4.6                              |

## SECTION 6

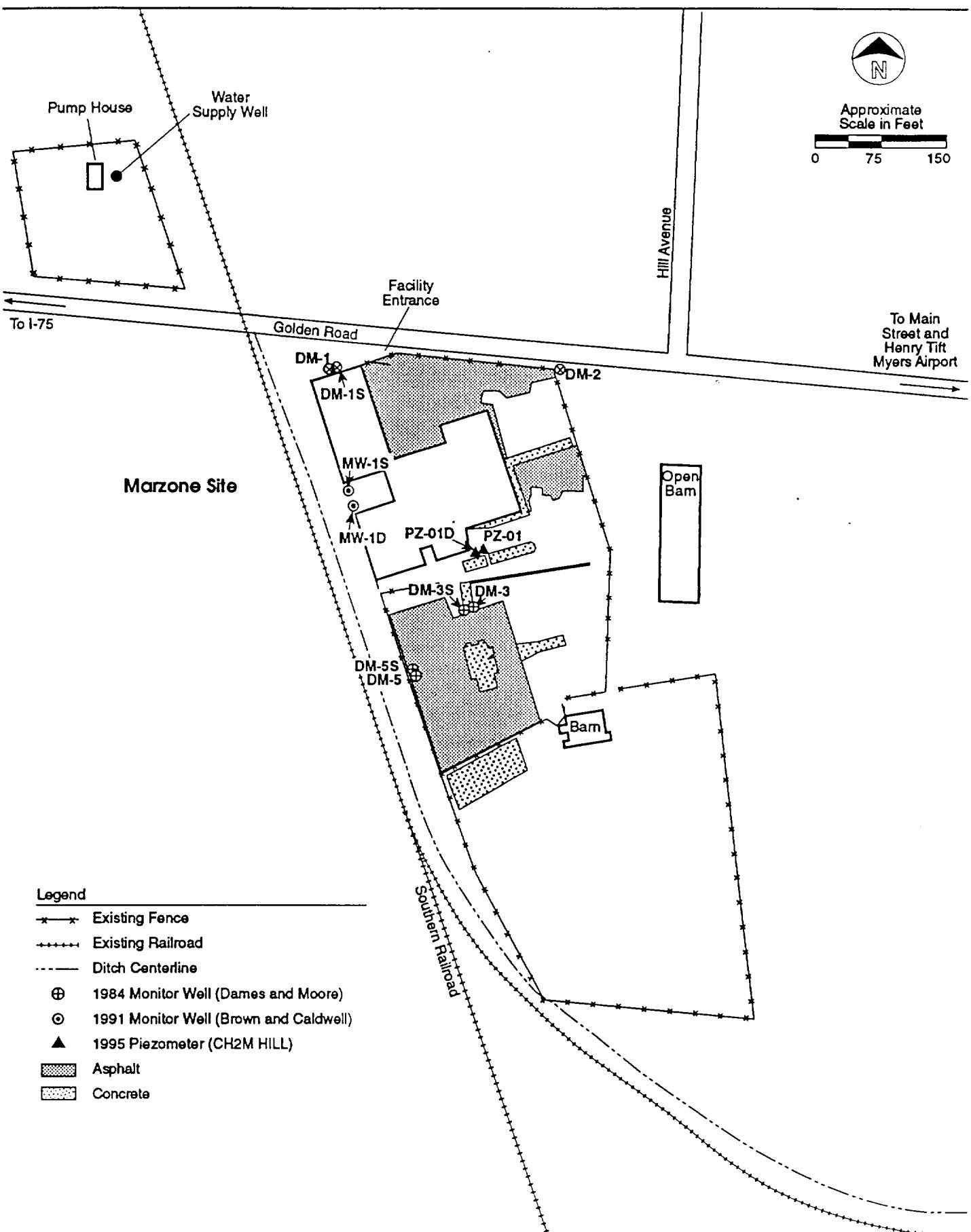
## Well Abandonment Procedures

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Nine monitor wells and two piezometers were abandoned. The locations of these wells and piezometers are shown in Exhibit 6-1. Seven of the monitor wells — DM-1, DM-1S, DM-2, DM-3, DM-3S, DM-5, and DM-5S — were installed by Dames and Moore in 1984 and were located outside the soil excavation area. The two remaining monitor wells (MW-1S and MW-1D) and the two piezometers (PZ-01 and PZ-01D) were located within the soil excavation area. Wells DM-4 and DM-4S, scheduled to be abandoned, had been abandoned previously.

For wells outside the soil excavation area, protective well covers and guard posts were removed from the ground. The well casings were pressure-grouted by using a tremie tube placed at the bottom of the well casing. Pressurized grout was forced out through the well screen into the filter material and up the inside of the casing. The tremie tube was extracted slowly as the grout filled the casing. This procedure occurred as one continuous operation until the grout reached a level of approximately 2 feet bls. The casing was then cut off even with the ground surface and filled with concrete from grout level (approximately 2 feet) to the land surface.

For wells inside the soil excavation area, the presence of well casings and screens would have obstructed excavation activities. Therefore, the casing and screens were removed and the open borehole was filled with a bentonite and grout mix according to the procedures described previously. The mix was approximately 90/10 percent bentonite and grout, respectively. This mixture will remain unconsolidated and prevent potential vertical pathways from forming when the excavation activities occur in this area.



**Exhibit 6-1**  
Abandoned Monitor Wells (March 1996)

## SECTION 7

# Residential Groundwater Monitoring

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## Sample Collection

Samples were collected between March 5 and March 14, 1996, from four private water supply wells within a 0.5-mile radius of the Marzone Site. The four well owners and pertinent information about the locations of the well are shown in Exhibit 7-1. These are the same four wells identified and sampled by the United States Environmental Protection Agency (EPA) in March 1995.

**EXHIBIT 7-1**
**Residential Groundwater Sampling Locations**

| Name and Address   | Directions and Well Information   |
|--|---|
| Amanda Angley<br>P.O. Box 421<br>Tifton, GA 31793                | House on north side of Golden Rd., approximately 0.25 miles east of the Marzone site. House has tin roof and boarded-up windows. Well does not have a pump and is covered by a washtub. Well is located approximately 100 feet northeast of the house.                            |
| Mrs. Bill Partain<br>409 Southern Ave.<br>Tifton, GA 31794       | House on dirt portion of Southern Ave., south of Golden Rd. From intersection of Golden and Southern, seventh house on west side of Southern Ave. House is blue with chain link fence. Well has pump in place and is contained in housing on south side of driveway.              |
| Mr. and Mrs. A.H. Horton<br>Route 2, Box 592<br>Tifton, GA 31794 | House is further south on Southern Ave. from Partain house. When Southern Ave. forks, bear right. House is approximately 0.6 mile down the right fork, on the right side of the road. Well has pump in place and is contained in decorative stone housing in front yard of house. |
| Mr. Willie Wilson<br>305 Cole St.<br>Tifton, GA 31794            | Second house on north side of Cole St., north of intersection of Cole St. and King St. Well has pump in place and is covered by a blanket on the west side of house.  |

Samples from all wells were collected using the same procedures performed in the March 1995 residential groundwater sampling as described in the South Tifton Residential Area Investigation Report (EPA, 1995). To simulate the well system as it is actually used, none of the wells were purged before sampling. Samples from the Partain, Horton, and Wilson wells were collected directly from taps at the well pumps. The sample from the Angley well was collected using a disposable teflon bailer. At Ms. Angley's request, care was taken to not stir up sediments at the bottom of the well.

Sample collection and analysis information are summarized in Exhibit 7-2. Temperature, conductivity, pH, and turbidity were measured in the field for each sample. Results of field measurements are shown in Exhibit 7-3.

**EXHIBIT 7-2**  
**Sample Collection and Analysis**  
**Residential Groundwater Sampling**

| Location Name | Property Owner | Grab or Composite | Type | Organochlorine Pesticides (8081) | Organophosphorus Pesticides (8141) | Volatile Organic Compounds (8020) | Metals (a) |
|---------------|----------------|-------------------|------|----------------------------------|------------------------------------|-----------------------------------|------------|
| RG-W01        | Horton         | G                 | N    | 1                                | 1                                  | 1                                 | 1          |
| RG-W02        | Partain        | G                 | N    | 1                                | 1                                  | 1                                 | 1          |
| RG-W03        | Angley         | G                 | N    | 1                                | 1                                  | 1                                 | 1          |
| RG-W04        | Wilson         | G                 | N    | 1                                | 1                                  | 1                                 | 1          |
| <b>Totals</b> |                |                   |      | 5                                | 5                                  | 5                                 | 5          |

Notes:

<sup>a</sup>Metals/methods requested as follows:

7061: Arsenic

7421: Lead

6010: Chromium, zinc

N = Normal

FD = Field duplicate

**EXHIBIT 7-3**  
**Field Parameters**  
**Residential Groundwater Sampling**

| Location Name | Property Owner | Date    | Time  | pH  | Temperature (C) | Conductivity ( $\mu\text{mhos/cm}$ ) | Turbidity (NTU) |
|---------------|----------------|---------|-------|-----|-----------------|--------------------------------------|-----------------|
| RG-W01        | Horton         | 3/4/96  | 17:25 | 6.6 | 18              | 85                                   | 0.42            |
| RG-W02        | Partain        | 3/4/96  | 16:35 | 7.7 | 20              | 62                                   | 6.5             |
| RG-W03        | Angley         | 3/14/96 | 14:20 | 5.5 | 20.5            | 30                                   | 0.13            |
| RG-W04        | Wilson         | 3/4/96  | 16:00 | 5.2 | 17.5            | 50                                   | 1.2             |

$\mu\text{mhos/cm}$  = Micromhos per centimeter

NTU = Nephelometric turbidity unit

C = Degrees Celsius

## Analytical Results

Residential groundwater analytical data are summarized in Exhibit 7-4. Samples were analyzed for the constituents identified in the Consent Decree Statement of Work. These constituents are included in the parameters listed in Exhibit 7-4 and are identified by boldface type.

Neither purgeable aromatics nor pesticides were detected in samples from any of the four wells. Low levels of chromium (two wells), lead (two wells), and zinc (two wells) were detected. In all cases, detections were below the Georgia maximum contaminant levels (MCLs) of 0.1 mg/L for chromium, 0.015 mg/L for lead, and 5 mg/L (secondary MCL) for zinc.

A field duplicate was collected from the Wilson well, with results summarized in Exhibit 7-4. Results of the field duplicate are similar to those from the native sample for all parameters.

**EXHIBIT 7-4**  
**Analytical Data Summary, Residential Groundwater**  
**March, 1996**

| Parameters/Units       | Well Owner<br>StationID<br>SampleID<br>Collection Date | Horton<br>RGW01<br>MGA082<br>03/04/96 | Partain<br>RGW02<br>MGA083<br>03/04/96 | Angley<br>RGW03<br>MGA084<br>03/14/96 | Wilson<br>RGW04<br>MGA085<br>03/04/96 | Wilson<br>RGW04<br>MGA086FD<br>03/04/96 |
|------------------------|--|---------------------------------------|--|---------------------------------------|---------------------------------------|---|
| <b>PESTICIDES</b>      |  |                                       |  |                                       |                                       |   |
| Alpha-BHC              | mg/L   | U .00002                              | U .00002                               | U .00002                              | U .00002                              | U .00002                                |
| Beta-BHC               | mg/L   | U .00004                              | U .00004                               | U .00004                              | U .00004                              | U .00004                                |
| Delta-BHC              | mg/L   | U .00002                              | U .00002                               | U .00002                              | U .00002                              | U .00002                                |
| Gamma-BHC<br>(lindane) | mg/L   | U .00002                              | U .00002                               | U .00002                              | U .00002                              | U .00002                                |
| Heptachlor             | mg/L   | U .00002                              | U .00002                               | U .00002                              | U .00002                              | U .00002                                |
| Aldrin                 | mg/L   | U .00002                              | U .00002                               | U .00002                              | U .00002                              | U .00002                                |
| Heptachlor epoxide     | mg/L   | U .00002                              | U .00002                               | U .00002                              | U .00002                              | U .00002                                |
| Endosulfan I           | mg/L   | U .00002                              | U .00002                               | U .00002                              | U .00002                              | U .00002                                |
| Dieldrin               | mg/L   | U .00002                              | U .00002                               | U .00002                              | U .00002                              | U .00002                                |
| 4,4'-DDE               | mg/L   | U .00002                              | U .00002                               | U .00002                              | U .00002                              | U .00002                                |
| Endrin                 | mg/L   | U .00004                              | U .00004                               | U .00004                              | U .00004                              | U .00004                                |
| Endosulfan II          | mg/L   | U .00004                              | U .00004                               | U .00004                              | U .00004                              | U .00004                                |
| 4,4'-DDD               | mg/L   | U .00004                              | U .00004                               | U .00004                              | U .00004                              | U .00004                                |
| Endosulfan sulfate     | mg/L   | U .00004                              | U .00004                               | U .00004                              | U .00004                              | U .00004                                |
| 4,4'-DDT               | mg/L   | U .00004                              | U .00004                               | U .00004                              | U .00004                              | U .00004                                |
| Methoxychlor           | mg/L   | U .00008                              | U .00008                               | U .00008                              | U .00008                              | U .00008                                |
| Endrin aldehyde        | mg/L   | U .00004                              | U .00004                               | U .00004                              | U .00004                              | U .00004                                |
| Chlordane              | mg/L   | U .0002                               | U .0002                                | U .0002                               | U .0002                               | U .0002                                 |
| Toxaphene              | mg/L   | U .001                                | U .001                                 | U .001                                | U .001                                | U .001                                  |
| Endrin ketone          | mg/L   | U .00004                              | U .00004                               | U .00004                              | U .00004                              | U .00004                                |
| Parathion, methyl      | mg/L   | U .001                                | U .001                                 | U .001                                | U .001                                | U .001                                  |
| Atrazine               | mg/L   | U .001                                | U .001                                 | U .001                                | U .001                                | U .001                                  |
| Parathion, ethyl       | mg/L   | U .001                                | U .001                                 | U .001                                | U .001                                | U .001                                  |
| Aroclor 1016           | mg/L   | U .001                                | U .001                                 | U .001                                | U .001                                | U .001                                  |
| Aroclor 1221           | mg/L   | U .002                                | U .002                                 | U .002                                | U .002                                | U .002                                  |
| Aroclor 1232           | mg/L   | U .002                                | U .002                                 | U .002                                | U .002                                | U .002                                  |
| Aroclor 1242           | mg/L   | U .001                                | U .001                                 | U .001                                | U .001                                | U .001                                  |
| Aroclor 1248           | mg/L   | U .001                                | U .001                                 | U .001                                | U .001                                | U .001                                  |
| Aroclor 1254           | mg/L   | U .0005                               | U .0005                                | U .0005                               | U .0005                               | U .0005                                 |
| Aroclor 1260           | mg/L   | U .0005                               | U .0005                                | U .0005                               | U .0005                               | U .0005                                 |

**EXHIBIT 7-4**
**Analytical Data Summary, Residential Groundwater**  
**March, 1996**

| Parameters/Units           | Well Owner<br>StationID<br>SampleID<br>Collection Date | Horton<br>RGW01<br>MGA082<br>03/04/96 | Partain<br>RGW02<br>MGA083<br>03/04/96 | Angley<br>RGW03<br>MGA084<br>03/14/96 | Wilson<br>RGW04<br>MGA085<br>03/04/96 | Wilson<br>RGW04<br>MGA086FD<br>03/04/96 |
|----------------------------|--|---------------------------------------|--|---------------------------------------|---------------------------------------|---|
| <b>PURGEABLE AROMATICS</b> |  |                                       |  |                                       |                                       |   |
| Benzene                    | mg/L   | <b>U .001</b>                         | <b>U .001</b>                          | <b>U .001</b>                         | <b>U .001</b>                         | <b>U .001</b>                           |
| Chlorobenzene              | mg/L   | <b>U .001</b>                         | <b>U .001</b>                          | <b>U .001</b>                         | <b>U .001</b>                         | <b>U .001</b>                           |
| 1,3-dichlorobenzene        | mg/L   | <b>U .001</b>                         | <b>U .001</b>                          | <b>U .001</b>                         | <b>U .001</b>                         | <b>U .001</b>                           |
| 1,4-dichlorobenzene        | mg/L   | <b>U .001</b>                         | <b>U .001</b>                          | <b>U .001</b>                         | <b>U .001</b>                         | <b>U .001</b>                           |
| 1,2-dichlorobenzene        | mg/L   | <b>U .001</b>                         | <b>U .001</b>                          | <b>U .001</b>                         | <b>U .001</b>                         | <b>U .001</b>                           |
| <b>Ethylbenzene</b>        | <b>mg/L</b>  | <b>U .001</b>                         | <b>U .001</b>                          | <b>U .001</b>                         | <b>U .001</b>                         | <b>U .001</b>                           |
| Methyl-tert-butylether     | mg/L   | <b>U .001</b>                         | <b>U .001</b>                          | <b>U .001</b>                         | <b>U .001</b>                         | <b>U .001</b>                           |
| Toluene                    | mg/L   | <b>U .001</b>                         | <b>U .001</b>                          | <b>U .001</b>                         | <b>U .001</b>                         | <b>U .001</b>                           |
| Xylenes, total             | mg/L   | <b>U .002</b>                         | <b>U .002</b>                          | <b>U .002</b>                         | <b>U .002</b>                         | <b>U .002</b>                           |
| <b>METALS</b>              |  |                                       |  |                                       |                                       |   |
| Arsenic                    | mg/L   | <b>U .00068</b>                       | <b>U .00096</b>                        | <b>U .0013</b>                        | <b>U .00079</b>                       | <b>U .00075</b>                         |
| Chromium, total            | mg/L   | <b>U .0022</b>                        | <b>J .0025</b>                         | <b>J .0023</b>                        | <b>U .0022</b>                        | <b>U .0022</b>                          |
| Lead                       | mg/L   | <b>= .0116</b>                        | <b>UJ .0023</b>                        | <b>J .0015</b>                        | <b>= .0038</b>                        | <b>= .004</b>                           |
| Zinc                       | mg/L   | <b>= .0515</b>                        | <b>U .0083</b>                         | <b>U .0096</b>                        | <b>= .101</b>                         | <b>= .0992</b>                          |

FD: Field Duplicate

U: Not detected

=: Detected

J: Estimated - detected below reporting limit

UJ: Not detected above levels detected in QC blanks

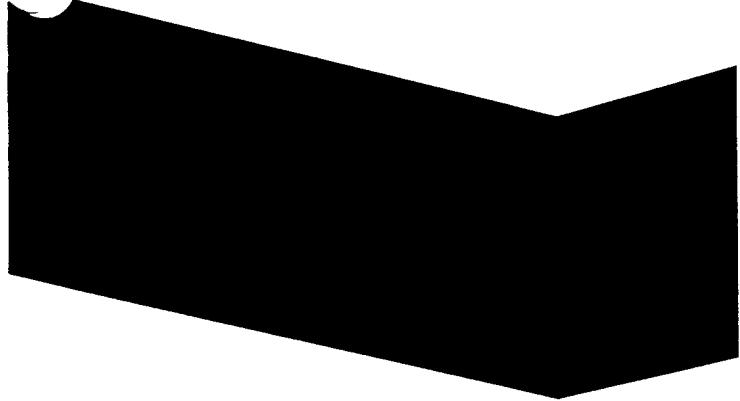
Boldface type indicates constituents as identified in the Consent Decree Statement of Work.

## SECTION 8

## Works Cited

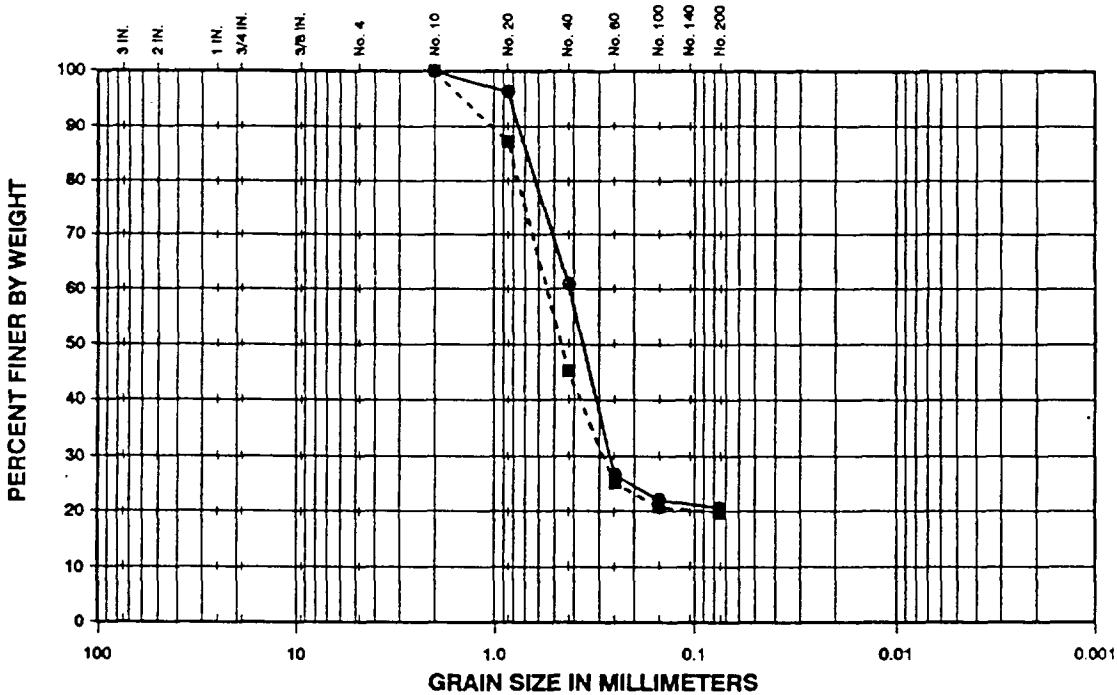
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## **Appendix A Sieve Analysis**

U.S. STANDARD SIEVE SIZE



| GRAVEL |      | SAND   |        |      | SILT | CLAY |
|--------|------|--------|--------|------|------|------|
| COARSE | FINE | COARSE | MEDIUM | FINE |      |      |

| TEST HOLE NO. | SAMPLE NO. | DEPTH   | SYMBOL | SAMPLE DESCRIPTION                  | UNIFIED CLASS. |
|---------------|------------|---------|--------|-------------------------------------|----------------|
| PW-1          | 3          | 16'-18' | ●      | SILTY TO CLAYEY MEDIUM TO FINE SAND | SM to SC       |
| PW-1          | 4          | 18'20'  | ■      | SILTY TO CLAYEY MEDIUM TO FINE SAND | SM to SC       |
|               |            |         |        |                                     |                |
|               |            |         |        |                                     |                |
|               |            |         |        |                                     |                |
|               |            |         |        |                                     |                |

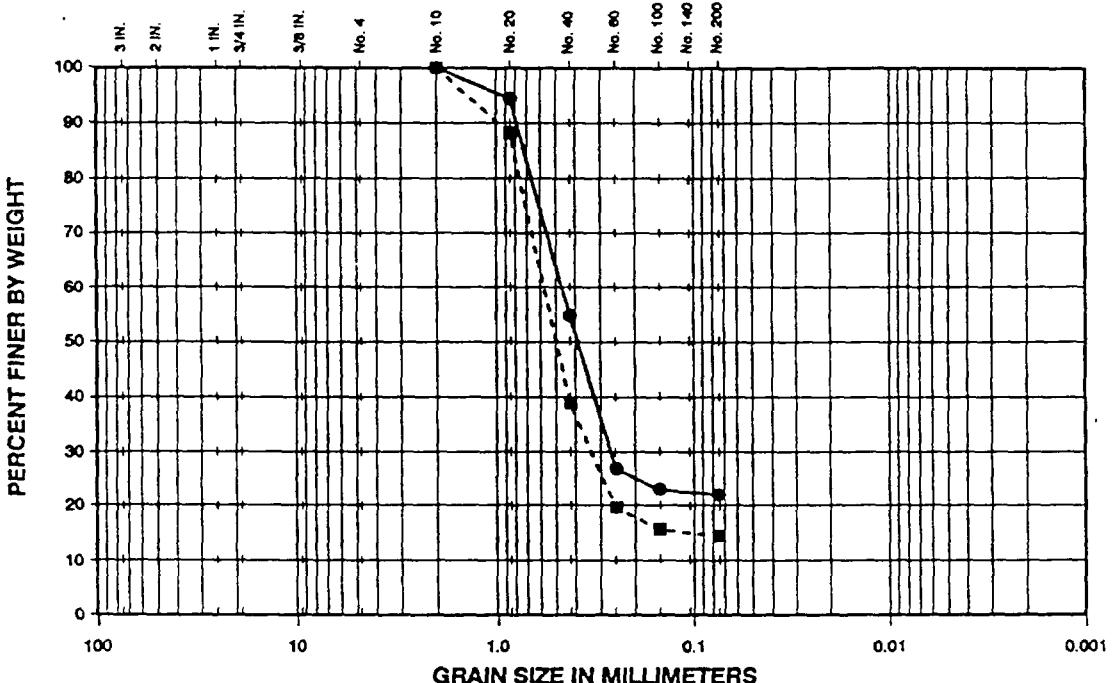
**GRAIN SIZE DISTRIBUTION**



**MARZONE SUPERFUND SITE  
TIFTON, GEORGIA**

|                   |                 |                            |
|-------------------|-----------------|----------------------------|
| DRAWN BY: TEB     | CHECKED BY: JPM | DATE: 3-22-96              |
| FILE NO.: 96-1414 | APPROVED BY:    | FIGURE: <i>[Signature]</i> |

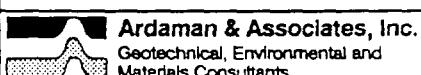
**U.S. STANDARD SIEVE SIZE**



| GRAVEL |      | SAND   |        |      | SILT | CLAY |
|--------|------|--------|--------|------|------|------|
| COARSE | FINE | COARSE | MEDIUM | FINE |      |      |

| TEST HOLE NO. | SAMPLE NO. | DEPTH   | SYMBOL | SAMPLE DESCRIPTION                  | UNIFIED CLASS. |
|---------------|------------|---------|--------|-------------------------------------|----------------|
| PZ-4          | 2          | 17'-19' | ●      | SILTY TO CLAYEY MEDIUM TO FINE SAND | SM to SC       |
| PZ-4          | 3          | 19'-21' | ■      | SILTY TO CLAYEY MEDIUM TO FINE SAND | SM to SC       |
|               |            |         |        |                                     |                |
|               |            |         |        |                                     |                |
|               |            |         |        |                                     |                |
|               |            |         |        |                                     |                |

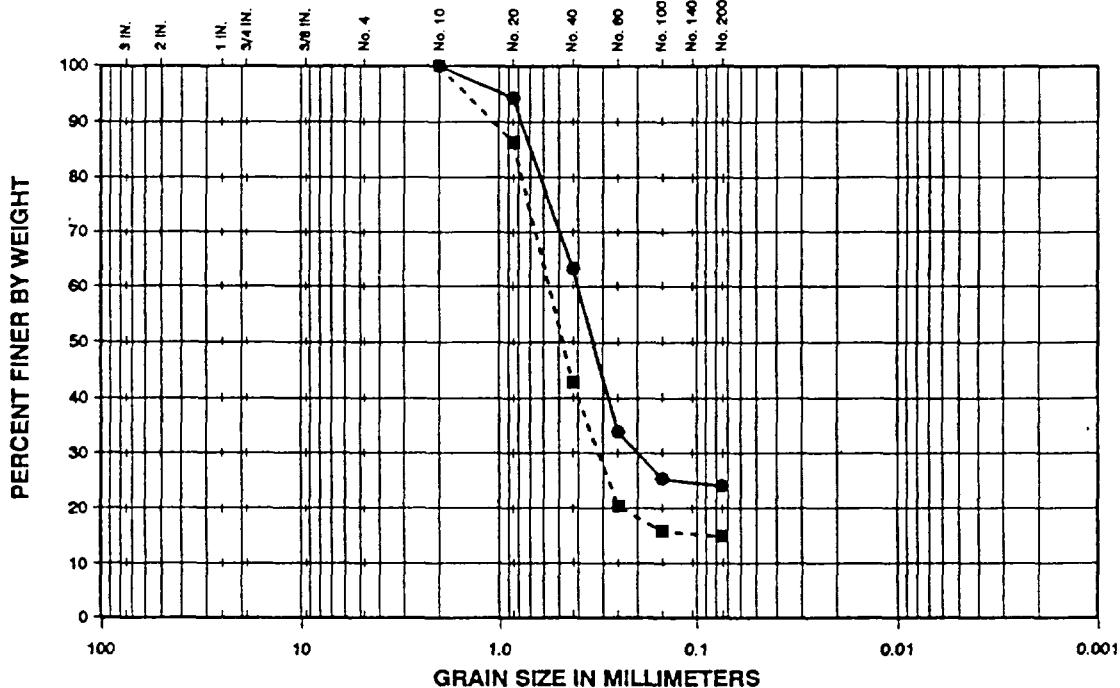
**GRAIN SIZE DISTRIBUTION**



**MARZONE SUPERFUND SITE  
TIFTON, GEORGIA**

|                   |                 |               |
|-------------------|-----------------|---------------|
| DRAWN BY: TEB     | CHECKED BY: JPM | DATE: 3-22-96 |
| FILE NO.: 96-1414 | APPROVED BY:    | FIGURE:       |

**U.S. STANDARD SIEVE SIZE**



| GRAVEL |      | SAND   |        |      | SILT | CLAY |
|--------|------|--------|--------|------|------|------|
| COARSE | FINE | COARSE | MEDIUM | FINE |      |      |

| TEST HOLE NO. | SAMPLE NO. | DEPTH   | SYMBOL | SAMPLE DESCRIPTION                  | UNIFIED CLASS. |
|---------------|------------|---------|--------|-------------------------------------|----------------|
| PZ-3          | 1          | 18'-20' | ●      | SILTY TO CLAYEY MEDIUM TO FINE SAND | SM to SC       |
| PZ-3          | 2          | 20'-22' | ■      | SILTY TO CLAYEY MEDIUM TO FINE SAND | SM to SC       |
|               |            |         |        |                                     |                |
|               |            |         |        |                                     |                |
|               |            |         |        |                                     |                |
|               |            |         |        |                                     |                |

**GRAIN SIZE DISTRIBUTION**



**MARZONE SUPERFUND SITE  
TIFTON, GEORGIA**

|                   |                          |                     |
|-------------------|--------------------------|---------------------|
| DRAWN BY: TEB     | CHECKED BY: JPM          | DATE: 3-22-96       |
| FILE NO.: 96-1414 | APPROVED BY: [Signature] | FIGURE: [Signature] |

## SIEVE ANALYSIS

## MATERIAL TESTED

CONCRETE C.A. ✓

SOILS

CONCRETE F.A. ✓

PROJECT MGRZINE SuperFUND site

SAMPLED BY Dept. 42 DATE 3-12-96 TESTED BY GW

DATE

3-21-96

FILE NO. 96-1414

| TEST HOLE NUMBER                                     |       |            | Pw01 / 3 |      | Pw01 / 4 |       | Pw03 / 1 |      | Pw03 / 2 |      | Pw03 / 2 |       |      |      |
|--|-------|------------|----------|------|----------|-------|----------|------|----------|------|----------|-------|------|------|
| DEPTH  | FROM  | 16         | TO       | 18   | 16'      | 18'   | 19'      | 20'  | 21'      | 22'  | 23'      | 24'   |      |      |
|  |       |            |          |      |          |       |          |      |          |      |          |       |      |      |
| SAMPLE DESCRIPTION                                   |       |            | 83       | D    | (D)      | (D)   | (D)      | (D)  | (D)      | (D)  | (D)      | (D)   |      |      |
| UNIFIED CLASSIFICATION                               |       |            |          |      |          |       |          |      |          |      |          |       |      |      |
| DRY SAMPLES AFTER WASHING<br>THROUGH #200 MESH SIEVE |       |            |          |      |          |       |          |      |          |      |          |       |      |      |
| TOTAL DRY SAMPLE (gr.)                               |       |            | 104.61   |      | 102.69   |       | 110.71   |      | 103.38   |      | 102.86   |       |      |      |
| U.S. SIEVE SIZE                                      |       |            | GRAMS    | X    |          | GRAMS | X        |      | GRAMS    | X    |          | GRAMS | X    |      |
| CONC. C.A.   | SOILS | CONC. F.A. |          | RET. | PASS     |       | RET.     | PASS |          | RET. | PASS     |       | RET. | PASS |
| 3  | 3/4   |            |          |      |          |       |          |      |          |      |          |       |      |      |
| 2½   | 3/8   |            |          |      |          |       |          |      |          |      |          |       |      |      |
| 2  | 4     |            |          |      |          |       |          |      |          |      |          |       |      |      |
| 1½   | 10    |            | —        | 100  | —        | 100   | —        | 100  | —        | 100  | —        | 100   | —    | 100  |
| 1  | 20    | 3/8        | 3.88     | 26.3 | 13.12    | 87.2  | 6.39     | 94.2 | 14.4     | 86.3 | 5.8      | 94.4  |      |      |
| 3/4  | 40    | 4          | 40.77    | 61.0 | 56.25    | 45.2  | 40.58    | 63.3 | 60.3     | 42.8 | 46.5     | 51.8  |      |      |
| 1/2  | 60    | 8          | 76.65    | 24.7 | 76.85    | 25.2  | 73.17    | 33.9 | 83.9     | 26.4 | 75.1     | 27.0  |      |      |
| 3/8  | 100   | 16         | 81.42    | 22.2 | 81.31    | 20.8  | 82.63    | 25.4 | 88.6     | 15.9 | 79.1     | 23.1  |      |      |
| 4  | 140   | 30         |          |      |          |       |          |      |          |      |          |       |      |      |
| 8  | 200   | 50         | 82.94    | 20.7 | 82.32    | 19.8  | 84.02    | 24.1 | 89.6     | 15.0 | 80.1     | 22.1  |      |      |
| 16   | 270   | 100        |          |      |          |       |          |      |          |      |          |       |      |      |
| PAN  | PAN   | PAN        |          |      |          |       |          |      |          |      |          |       |      |      |
| 12/74 FORM 1010 E                                    |       |            |          |      |          |       |          |      |          |      |          |       |      |      |

SIEVE ANALYSISMATERIAL TESTED

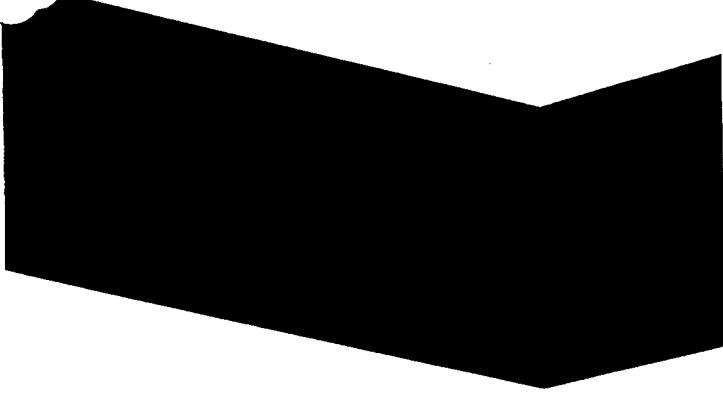
CONCRETE C.A.

SOILS

CONCRETE F.A.

PROJECT MARZONE Superfund SiteSAMPLED BY Dept. 42 DATE 3-12-96 TESTED BY GWDATE \_\_\_\_\_ FILE NO. 96-1414

| TEST HOLE NUMBER                                     |       |           | 1200/3 |  |           |       |  |           |       |  |           |           |  |  |
|--|-------|-----------|--------|--|-----------|-------|--|-----------|-------|--|-----------|-----------|--|--|
| DEPTH  | FROM  | 11        |        |  |           |       |  |           |       |  |           |           |  |  |
|  | TO    | 11        |        |  |           |       |  |           |       |  |           |           |  |  |
| SAMPLE DESCRIPTION                                   |       |           |        |  |           |       |  |           |       |  |           |           |  |  |
| UNIFIED CLASSIFICATION                               |       |           |        |  |           |       |  |           |       |  |           |           |  |  |
| DRY SAMPLES AFTER WASHING<br>THROUGH #200 MESH SIEVE |       |           |        |  |           |       |  |           |       |  |           |           |  |  |
| TOTAL DRY SAMPLE (gr.)                               |       |           | 101.37 |  |           |       |  |           |       |  |           |           |  |  |
| U.S. SIEVE SIZE                                      |       |           | GRAMS  |  | x         | GRAMS |  | x         | GRAMS |  | x         | GRAMS     |  |  |
| CONC. C.A  | SOILS | CONC. F.A |        |  | RET. PASS |       |  | RET. PASS |       |  | RET. PASS | RET. PASS |  |  |
| 3  | 3/4   |           |        |  |           |       |  |           |       |  |           |           |  |  |
| 2 1/2  | 3/8   |           |        |  |           |       |  |           |       |  |           |           |  |  |
| 2  | 4     |           |        |  |           |       |  |           |       |  |           |           |  |  |
| 1 1/2  | 10    |           | —      |  | 100       |       |  |           |       |  |           |           |  |  |
| 1  | 20    | 3/8       | 13.0   |  | 88.1      |       |  |           |       |  |           |           |  |  |
| 3/4  | 40    | 4         | 66.8   |  | 38.9      |       |  |           |       |  |           |           |  |  |
| 1/2  | 60    | 8         | 87.8   |  | 19.7      |       |  |           |       |  |           |           |  |  |
| 3/8  | 100   | 16        | 92.2   |  | 15.7      |       |  |           |       |  |           |           |  |  |
| 4  | 140   | 30        |        |  |           |       |  |           |       |  |           |           |  |  |
| 8  | 200   | 50        | 93.5   |  | 14.5      |       |  |           |       |  |           |           |  |  |
| 16   | 270   | 100       |        |  |           |       |  |           |       |  |           |           |  |  |
| PAN  | PAN   | PAN       |        |  |           |       |  |           |       |  |           |           |  |  |



## **Appendix B Soil Boring Lithology Forms**



|                                       |                              |              |
|---------------------------------------|------------------------------|--------------|
| PROJECT NUMBER<br><b>117612.G2.F2</b> | BORING NUMBER<br><b>PW01</b> | SHEET 1 OF 1 |
| <b>SOIL BORING LOG</b>                |                              |              |

PROJECT : MARZONE SUPERFUND SITE LOCATION : Tifton, Georgia  
ELEVATION : 346.49 ft NVGD - well pad surface DRILLING CONTRACTOR : Ardaman & Associates, Tallahassee, FL  
DRILLING METHOD AND EQUIPMENT USED : CME water rotary, 2-inch bit  
WATER LEVELS : 343.33 ft NVGD 3/20/96 START : 1330 3/12/96 END : 1530 3/12/96 LOGGER : M. L. Weatherby

| DEPTH BELOW SURFACE (FT) | STANDARD PENETRATION TEST RESULTS |               |        | CORE DESCRIPTION   | COMMENTS  |
|--------------------------|-----------------------------------|---------------|--------|--|---|
|                          | INTERVAL (FT)                     | RECOVERY (IN) | #/TYPE | SOIL NAME USCS GROUP SYMBOL, COLOR<br>MOISTURE CONTENT, RELATIVE DENSITY<br>OR CONSISTENCY SOIL STRUCTURE,<br>MINERALOGY | DEPTH OF CASING, DRILLING RATE<br>DRILLING FLUID LOSS,<br>TESTS AND INSTRUMENTATION |
|                          |                                   |               |        | 6"-6"-6"<br>(N)  |   |
| 5                        | 0-10                              | ---           | ---    | Clay, red to orange.   |   |
| 10                       | 10-12                             | 20            | S-1    | 7-7-12-12<br>(19) Clay (CL), orange red, purple, gray, with some sand, medium v. stiff, semi-plastic                     |   |
|                          | 12-14                             | 24            | S-2    | 7-7-8-9<br>(15) Clay (CL), w/Silty Sand (SM), reddish purple/gray CL v. stiff, SM semi-loose                             | sieve analysis sample #1 collected  |
| 15                       | 14-16                             | 24            | S-3    | 8-8-8-9<br>(16) Sandy Clay (CL), w/Silty Sand (SM), red to purple, low silt or clay zones, medium, semi-stiff            | sieve analysis sample #2 collected  |
|                          | 16-18                             | 24            | S-4    | 5-5-6-6<br>(11) Silty Sand (SM), orangish yellow, semi-loose, some clay content  | sieve analysis sample #3 collected and analyzed                                     |
| 20                       | 18-20                             | 24            | S-5    | 5-5-4-5<br>(11) Silty Sand (SM), orangish yellow, semi-loose clean red sand at bottom of spoon, loose                    | sieve analysis sample #4 collected and analyzed                                     |
|                          | 20-22                             | 24            | S-6    | 2-2-4-6<br>(6) 12" Silty Sand (SM), reddish purple, loose, med.<br>12" Clay (CH), red/yellowish brown, stiff, plastic    |   |
|                          | 22-24                             | 24            | S-7    | 4-4-6-6<br>(10) Clay (CH), red, v. stiff, v. plastic, no sand.   |   |
| 25                       |                                   |               |        |  | TD= 24 ft bsl<br>Well is set at 21.5 ft bsl.  |
| 30                       |                                   |               |        |  |   |
| 35                       |                                   |               |        |  |   |
| 40                       |                                   |               |        |  |   |



|                                |                       |              |
|--------------------------------|-----------------------|--------------|
| PROJECT NUMBER<br>117612.G2.F2 | BORING NUMBER<br>PZ02 | SHEET 1 OF 1 |
| <b>SOIL BORING LOG</b>         |                       |              |

PROJECT : MARZONE SUPERFUND SITE

LOCATION : Tifton, Georgia

ELEVATION : 347.24 ft NVGD - well pad surface

DRILLING CONTRACTOR : Ardaman &amp; Associates, Tallahassee, FL

DRILLING METHOD AND EQUIPMENT USED : CME water rotary, 2-inch bit

WATER LEVELS : 343.36 ft NVGD 3/20/96

START : 1130 3/11/96 END : 1220 3/11/96 LOGGER : M. L. Weatherby

| DEPTH BELOW SURFACE (FT) | STANDARD PENETRATION TEST RESULTS |               |        |                 | CORE DESCRIPTION   | COMMENTS                              |
|--------------------------|-----------------------------------|---------------|--------|-----------------|--|---------------------------------------|
|                          | INTERVAL (FT)                     | RECOVERY (IN) | #/TYPE | TEST RESULTS    |  |                                       |
| 6'-6"-6"-6"<br>(N)       |                                   |               |        |                 |  |                                       |
| 5                        |                                   |               |        |                 |  |                                       |
| 10                       | 0-20                              | ---           | ---    | ---             | Clay, red. with some sand  |                                       |
| 15                       |                                   |               |        |                 |  |                                       |
| 20                       | 20-22                             | 20            | S-1    | 4-4-3-3<br>(7)  | 4"-Clay (CL), gray, stiff, wet<br>16"-Silty Sand (SM), orange w/gray sand, zones |                                       |
|                          | 22-24                             | 20            | S-2    | 6-6-9-8<br>(15) | Clay (CL), red and gray, v. stiff, v. plastic, moist.                            |                                       |
| 25                       |                                   |               |        |                 |  | TD=24 ft bls<br>Well set at 23 ft bls |
| 30                       |                                   |               |        |                 |  |                                       |
| 35                       |                                   |               |        |                 |  |                                       |
| 40                       |                                   |               |        |                 |  |                                       |



|                                       |                              |              |
|---------------------------------------|------------------------------|--------------|
| PROJECT NUMBER<br><b>117612.G2.F2</b> | BORING NUMBER<br><b>PZ03</b> | SHEET 1 OF 1 |
| <b>SOIL BORING LOG</b>                |                              |              |

PROJECT : MARZONE SUPERFUND SITE

LOCATION : Tifton, Georgia

ELEVATION : 346.70 ft NVGD - well pad surface DRILLING CONTRACTOR : Ardaman &amp; Associates, Tallahassee, FL

DRILLING METHOD AND EQUIPMENT USED : CME water rotary, 2-inch bit

WATER LEVELS : 343.34 ft NVGD 3/20/96 START : 1550 3/11/96 END : 1740 3/11/96 LOGGER : M. L. Weatherby

| DEPTH BELOW SURFACE (FT) | STANDARD      |               |        | CORE DESCRIPTION | COMMENTS  |  |
|--------------------------|---------------|---------------|--------|------------------|---|--|
|                          | INTERVAL (FT) | PENETRATION   |        |                  |   |  |
|                          |               | RECOVERY (IN) | #/TYPE | TEST RESULTS     |   |  |
| 5                        |               |               |        |                  |   |  |
| 10                       | 0-18          | ---           | ---    | ---              | Clay, red with sand   |  |
| 15                       |               |               |        |                  |   |  |
| 20                       | 18-20         | 20            | S-1    | 4-5-5-4<br>(10)  | Silty Sand (SM), orange, fine, semi-stiff to semi-loose, wet                |  |
|                          | 20-22         | 12            | S-2    | 3-1-4-4<br>(5)   | Silty Sand (SM), orange, fine, semi-loose to loose, wet                     |  |
|                          | 22-24         | 5             | S-3    | 4-4-6-6<br>(10)  | Clay (CL), red and gray, some v. stiff zones, v. plastic, plugged up spoon. |  |
| 25                       |               |               |        |                  | TD=24 ft bds<br>Well set at 22 ft bds                                       |  |
| 30                       |               |               |        |                  |   |  |
| 35                       |               |               |        |                  |   |  |
| 40                       |               |               |        |                  |   |  |



|                                       |                              |              |
|---------------------------------------|------------------------------|--------------|
| PROJECT NUMBER<br><b>117612.G2.F2</b> | BORING NUMBER<br><b>PZ04</b> | SHEET 1 OF 1 |
| <b>SOIL BORING LOG</b>                |                              |              |

PROJECT : MARZONE SUPERFUND SITE LOCATION : Tifton, Georgia

ELEVATION : 346.68 ft NVGD - well pad surface DRILLING CONTRACTOR : Ardaman & Associates, Tallahassee, FL.

DRILLING METHOD AND EQUIPMENT USED : CME water rotary, 2-inch bit

WATER LEVELS : 343.31 ft NVGD 3/20/96 START : 1330 3/12/96 END : 1530 3/12/96 LOGGER : M. L. Weatherby

| DEPTH BELOW SURFACE (FT) | STANDARD PENETRATION TEST RESULTS |                         |                         | CORE DESCRIPTION   | COMMENTS   |
|--------------------------|-----------------------------------|-------------------------|-------------------------|--|--|
|                          | INTERVAL (FT)                     | RECOVERY (IN)<br>#/TYPE | 6*-6*-6*<br>(N)         | SOIL NAME USCS GROUP SYMBOL COLOR<br>MOISTURE CONTENT, RELATIVE DENSITY,<br>OR CONSISTENCY SOIL STRUCTURE,<br>MINERALOGY | DEPTH OF CASING DRILLING RATE<br>DRILLING FLUID LOSS<br>TESTS, AND INSTRUMENTATION |
|                          |                                   |                         |                         |  |  |
| 5                        |                                   |                         |                         |  | -  |
| 10                       |                                   |                         |                         |  | -  |
| 15                       | 0-15                              | ---                     | ---                     | Clay, red and gray   | -  |
| 20                       | 15-17                             | 24                      | S-1<br>7-7-8-10<br>(15) | Clay (CH), red and gray, w/zones of clayey sand.<br>in middle-clayey sand w/sand zones, moist                            | sieve analysis sample #1 collected   |
|                          | 17-19                             | 24                      | S-2<br>4-5-5-4<br>(10)  | Clayey Sand (SC), red and orange, semi-loose.<br>med. grained  | sieve analysis sample #2 collected and<br>analyzed                                 |
|                          | 19-21                             | 20                      | S-3<br>4-4-4-5<br>(8)   | Silty Sand (SM), reddish purple to orange, zones<br>of cleaner sand towards bottom of spoon                              | sieve analysis sample #3 collected and<br>analyzed                                 |
|                          | 21-23                             | 24                      | S-4<br>6-6-7-9<br>(13)  | Clay (CH), red and gray, v. stiff, v. plastic  | -  |
| 25                       |                                   |                         |                         |  | TD=23 ft bls<br>Well is set at 21.5 ft bls   |
| 30                       |                                   |                         |                         |  | -  |
| 35                       |                                   |                         |                         |  | -  |
| 40                       |                                   |                         |                         |  | -  |

## SOIL BORING CONSTRUCTION LOG

PROJECT: 5604 DATE: 7-3-91

CODE: MW-05 - DEEP TIME: 1300

METHOD: Hollow Stem Auger LOGGER: R. Hastings

| DEPTH INTERVAL | FORMATION DESCRIPTION                | BLOWS PER 6 IN. | COMMENTS |
|----------------|--------------------------------------|-----------------|----------|
| 0-2'           | Clayey sand, med. brn,<br>fg         |                 |          |
| 3-5'           | Sandy clay,<br>olive green, olive gy |                 | ODOR     |
| 5-11'          | Sandy clay,<br>med. brn, red brn     |                 | moist    |
| 11-14.5'       | Clayey sand,<br>lt. brn              |                 | moist    |
| 14.5-<br>17.5' | Sandy clay, lt brn                   |                 | wet      |
| 17.5-<br>20'   | Sandy clay,<br>occ. gravel           |                 |          |
| 20-<br>22.5'   | Sandy clay,<br>sl. red               |                 |          |
| 22.5-<br>25'   | .. clay, red, stiff                  |                 |          |
|                |                                      |                 |          |
|                |                                      |                 |          |

## SOIL BORING CONSTRUCTION LOG

PROJECT: 5604 DATE: 7-4-91  
 CODE: MW-06 . DEEP TIME: 0800  
 METHOD: Hollow Stem Auger LOGGER: L. Morrison

| DEPTH INTERVAL | FORMATION DESCRIPTION  | BLOWS PER 6 IN. | COMMENTS |
|----------------|--|-----------------|----------|
| 0-2'           | Sand, DK gy brn, fg  |                 |          |
| 2-3'           | Clayey sand, gy-green  |                 |          |
| 3-4'           | AS ABOVE   |                 |          |
| 4-7'           | Sandy clay, orange   |                 |          |
| 7-10'          | Clayey sand / Sandy clay, red-tan, lt. brn, f-mg<br>dk red at 9.5' |                 |          |
| 10-15'         | Silty clay, dk red, dkgy<br>stiff                                  |                 |          |
| 15-17'         | Clay, red w/lt gy<br>striations, sl. silty                         |                 |          |
| 17-25'         | " AS ABOVE   |                 |          |
|                |  |                 |          |
|                |  |                 |          |



|                                       |                                  |              |
|---------------------------------------|----------------------------------|--------------|
| PROJECT NUMBER<br><b>117612.FF.RP</b> | BORING NUMBER<br><b>GFMW-10S</b> | SHEET 1 OF 1 |
| <b>SOIL BORING LOG</b>                |                                  |              |

| PROJECT : MARZONE SITE INVESTIGATIONS  |             |                    |   | LOCATION : GOATFIELD   |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
|--|-------------|--------------------|---|--|--------------------------|----------|------------------|----------|---------------|-------------|--|--|---------------|--------|--------------|--|--|--|--------------------|--|--|--|--|--|--|--|--|--|
| ELEVATION : GROUND 346.6 FT NGVD   |             |                    |   | DRILLING CONTRACTOR : ARDAMAN & ASSOCIATES   |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| DRILLING METHOD AND EQUIPMENT USED : CME 55, 4-1/4" ID HOLLOW STEM AUGER   |             |                    |   |  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| WATER LEVELS : START : 11/06/95, 1300 END : 11/06/95, 1545   |             |                    |   | LOGGER : S. ROBERTI  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| <table border="1"><thead><tr><th>DEPTH BELOW SURFACE (FT)</th><th>STANDARD</th><th>CORE DESCRIPTION</th><th>COMMENTS</th></tr><tr><th>INTERVAL (FT)</th><th>PENETRATION</th><th></th><th></th></tr><tr><th>RECOVERY (IN)</th><th>#/TYPE</th><th>TEST RESULTS</th><th></th></tr><tr><th></th><th></th><th>6'-6"-6"-6"<br/>(N)</th><th></th></tr></thead><tbody><tr><td></td><td></td><td></td><td>SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.</td></tr><tr><td></td><td></td><td></td><td>DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.</td></tr></tbody></table> |             |                    |   |  | DEPTH BELOW SURFACE (FT) | STANDARD | CORE DESCRIPTION | COMMENTS | INTERVAL (FT) | PENETRATION |  |  | RECOVERY (IN) | #/TYPE | TEST RESULTS |  |  |  | 6'-6"-6"-6"<br>(N) |  |  |  |  | SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY. |  |  |  | DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. |
| DEPTH BELOW SURFACE (FT)   | STANDARD    | CORE DESCRIPTION   | COMMENTS  |  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| INTERVAL (FT)  | PENETRATION |                    |   |  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| RECOVERY (IN)  | #/TYPE      | TEST RESULTS       |   |  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
|  |             | 6'-6"-6"-6"<br>(N) |   |  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
|  |             |                    | SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.        |  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
|  |             |                    | DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.  |  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| 5  |             |                    | Cuttings:<br>0'-1' Brown silty clay - topsoil<br>1'-2' Light brown clayey silt<br>2'-5' Sandy clay with silt, reddish brown | 2' strong pesticide odor   |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| 5  | 5-7         | S-1                | 18"   | 7-11-14-18 Sandy Clay (CH) - deep reddish brown/white, mottled, numerous sand grains, med. to coarse.<br>Stiff to very stiff, moist, plastic                                   |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| 10   |             |                    | Cuttings:<br>7'-10' Sandy clay, light reddish brown to pinkish brown  | OVM in hollow stem 200 ppm   |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| 10   | 10-12       | S-2                | 14"   | 8-12-14-16 7' Clay (CH) white/purple mottled w/trace of fine sand, moist, stiff plastic<br>7' Sandy clay (CH) white/purple/reddish brown with med. sand, moist, plastic, stiff |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| 15   |             |                    | Cuttings 10-15'<br>Purple/brown clay with trace of sand   | OVM in hollow stem 20-30 ppm   |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| 20   |             |                    |   | Strong pesticide odor at all depths  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| 20   |             |                    |   | TD = 15'   |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| 25   |             |                    |   |  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| 30   |             |                    |   |  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| 35   |             |                    |   |  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |
| 40   |             |                    |   |  |                          |          |                  |          |               |             |  |  |               |        |              |  |  |  |                    |  |  |  |  |  |  |  |  |  |



|                                       |                                  |              |
|---------------------------------------|----------------------------------|--------------|
| PROJECT NUMBER<br><b>117612.FF.RP</b> | BORING NUMBER<br><b>GFMW-10D</b> | SHEET 1 OF 1 |
| <b>SOIL BORING LOG</b>                |                                  |              |

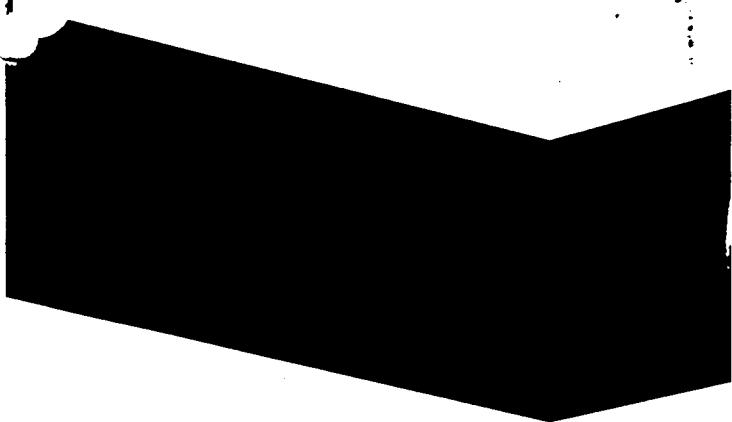
PROJECT : MARZONE SITE INVESTIGATION LOCATION : GOATFIELD  
ELEVATION : GROUND 346.5 FT NGVD DRILLING CONTRACTOR : ARDAMAN & ASSOCIATES  
DRILLING METHOD AND EQUIPMENT USED : CME 55, 4-1/4" ID HOLLOW STEM AUGER  
WATER LEVELS : START : 11/07/95, 0730 END : 11/07/95, 1150 LOGGER : S. ROBERTI

| DEPTH BELOW SURFACE (FT) | STANDARD PENETRATION TEST RESULTS |               |        | CORE DESCRIPTION  | COMMENTS   |
|--------------------------|-----------------------------------|---------------|--------|---|--|
|                          | INTERVAL (FT)                     | RECOVERY (IN) | #/TYPE | 6"-6"-6"-6"<br>(N)  |  |
| 5                        |                                   |               |        | Cuttings:<br>0'-1' Brown silty sand topsoil<br>1'-2' Light brown clayey silt<br>2'-5' Sandy clay, reddish brown<br><br>5'-7' Light reddish brown to pink clay and sandy clay<br>7'-9' Same as above<br><br>9'-10' Clay - purplish red<br>10'-13' Purplish red clay and sandy clay<br><br>13'-15' Tan sandy clay, moist<br><br>15'-20' Clayey sand, tan, wet | Strong pesticide odor 0-5'<br>OVM 200-300 from fresh cuttings<br><br>OVM cuttings approx. 15 ppm<br><br>OVM cuttings approx 12 ppm<br><br>OVM cuttings 0-2 ppm<br>very<br>wet<br>cuttings  |
| 10                       |                                   |               |        |   |  |
| 15                       |                                   |               |        |   |  |
| 20                       | 20-22                             | S-1           | 1.5"   | 5-2-4-4   | Poor recovery 0.5" sand, yellow, loose,<br>med. wet<br>.5" Clay - stiff, purple, moist<br>.5" Sandy clay - brown, med. stiff, moist<br><br>Clay (CH) reddish pink/light gray mottled,<br>trace of sand, med. stiff to med. soft, moist |
| 25                       | 22-24                             | S-2           | 14"    | 3-4-6-9   | TD = 25 ft.  |
| 30                       |                                   |               |        |   |  |
| 35                       |                                   |               |        |   |  |
| 40                       |                                   |               |        |   |  |



|                                       |                                  |              |
|---------------------------------------|----------------------------------|--------------|
| PROJECT NUMBER<br><b>117612.FF.RP</b> | BORING NUMBER<br><b>RLMW-11D</b> | SHEET 1 OF 1 |
| <b>SOIL BORING LOG</b>                |                                  |              |

| PROJECT : MARZONE SITE INVESTIGATIONS   |                                   |   |  | LOCATION : RINSATE LAGOON                  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
|---|-----------------------------------|---|--|--|-----------------------------------|------------------|----------|--|---------------|----------------------|--|--|--|--|--|--------------------|--|--|---|--|---|--|--|----|--|---|-----------------|--|----|--|--------------------------------------|-----------------|--|----|--|---|--|--|-----------|---------|---|---------------------------|--|----|--|---|--|--|--|--|----------|--|--|----|--|--|--|--|----|--|--|--|--|----|--|--|--|--|
| ELEVATION : GROUND 347.4 FT NGVD  |                                   |   |  | DRILLING CONTRACTOR : ARDAMAN & ASSOCIATES |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| DRILLING METHOD AND EQUIPMENT USED : CME 55. 4-1/4" ID, HOLLOW STEM AUGER   |                                   |   |  |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| WATER LEVELS : START : 11/08/95, 1130 END : 11/08/95, 1500  |                                   |   |  | LOGGER : S. ROBERTI                        |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">DEPTH BELOW SURFACE (FT)</th> <th style="text-align: left;">STANDARD PENETRATION TEST RESULTS</th> <th style="text-align: left;">CORE DESCRIPTION</th> <th colspan="2" style="text-align: left;">COMMENTS</th> </tr> <tr> <th>INTERVAL (FT)</th> <th>RECOVERY (IN) #/TYPE</th> <th>SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.</th> <th colspan="2">DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.</th> </tr> <tr> <th></th> <th></th> <th>6'-6"-6"-6"<br/>(N)</th> <th colspan="2"></th> </tr> </thead> <tbody> <tr> <td>5</td> <td></td> <td>Cuttings:<br/>0'-8' Brown to light reddish brown silty clay, some sand present. Low odor, moist.</td> <td colspan="2"></td> </tr> <tr> <td>10</td> <td></td> <td>8' Gray coarse sand and silt, coarse size, limerock frags; moist.</td> <td colspan="2">Pesticide odor.</td> </tr> <tr> <td>15</td> <td></td> <td>11' - 15' Reddish brown clay; moist.</td> <td colspan="2">Pesticide odor.</td> </tr> <tr> <td>20</td> <td></td> <td>15' - 18' Reddish brown clay as above. Moist.<br/>Approx. 18' Wet sand, light brown.</td> <td colspan="2"></td> </tr> <tr> <td>20' - 22'</td> <td>S-1 24"</td> <td>5-5-10-10<br/>8" Sand w/silt (SP), yellow/brown; wet, loose med.<br/>8" Clayey sand (SC) white to light purple. Moist medium dense. Abundant 3/8" grains at bottom.<br/>8" clay (CH) yellow to deep reddish brown, stiff, moist, highly plastic.</td> <td colspan="2">Too windy to notice odor.</td> </tr> <tr> <td>25</td> <td></td> <td>22' - 25' Wet sand and sandy silt cuttings.</td> <td colspan="2"></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">TD = 25'</td> <td colspan="2"></td> </tr> <tr> <td>30</td> <td></td> <td></td> <td colspan="2"></td> </tr> <tr> <td>35</td> <td></td> <td></td> <td colspan="2"></td> </tr> <tr> <td>40</td> <td></td> <td></td> <td colspan="2"></td> </tr> </tbody> </table> |                                   |   |  | DEPTH BELOW SURFACE (FT)                   | STANDARD PENETRATION TEST RESULTS | CORE DESCRIPTION | COMMENTS |  | INTERVAL (FT) | RECOVERY (IN) #/TYPE | SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY. | DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. |  |  |  | 6'-6"-6"-6"<br>(N) |  |  | 5 |  | Cuttings:<br>0'-8' Brown to light reddish brown silty clay, some sand present. Low odor, moist. |  |  | 10 |  | 8' Gray coarse sand and silt, coarse size, limerock frags; moist. | Pesticide odor. |  | 15 |  | 11' - 15' Reddish brown clay; moist. | Pesticide odor. |  | 20 |  | 15' - 18' Reddish brown clay as above. Moist.<br>Approx. 18' Wet sand, light brown. |  |  | 20' - 22' | S-1 24" | 5-5-10-10<br>8" Sand w/silt (SP), yellow/brown; wet, loose med.<br>8" Clayey sand (SC) white to light purple. Moist medium dense. Abundant 3/8" grains at bottom.<br>8" clay (CH) yellow to deep reddish brown, stiff, moist, highly plastic. | Too windy to notice odor. |  | 25 |  | 22' - 25' Wet sand and sandy silt cuttings. |  |  |  |  | TD = 25' |  |  | 30 |  |  |  |  | 35 |  |  |  |  | 40 |  |  |  |  |
| DEPTH BELOW SURFACE (FT)  | STANDARD PENETRATION TEST RESULTS | CORE DESCRIPTION  | COMMENTS   |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
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|   |                                   | 6'-6"-6"-6"<br>(N)  |  |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 5   |                                   | Cuttings:<br>0'-8' Brown to light reddish brown silty clay, some sand present. Low odor, moist.   |  |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 10  |                                   | 8' Gray coarse sand and silt, coarse size, limerock frags; moist.   | Pesticide odor.  |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 15  |                                   | 11' - 15' Reddish brown clay; moist.  | Pesticide odor.  |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 20  |                                   | 15' - 18' Reddish brown clay as above. Moist.<br>Approx. 18' Wet sand, light brown.   |  |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 20' - 22'   | S-1 24"                           | 5-5-10-10<br>8" Sand w/silt (SP), yellow/brown; wet, loose med.<br>8" Clayey sand (SC) white to light purple. Moist medium dense. Abundant 3/8" grains at bottom.<br>8" clay (CH) yellow to deep reddish brown, stiff, moist, highly plastic. | Too windy to notice odor.  |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 25  |                                   | 22' - 25' Wet sand and sandy silt cuttings.   |  |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
|   |                                   | TD = 25'  |  |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 30  |                                   |   |  |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 35  |                                   |   |  |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 40  |                                   |   |  |  |                                   |                  |          |  |               |                      |  |  |  |  |  |                    |  |  |   |  |   |  |  |    |  |   |                 |  |    |  |                                      |                 |  |    |  |   |  |  |           |         |   |                           |  |    |  |   |  |  |  |  |          |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |



## **Appendix C**

### **Monitor Well**

### **Completion**

### **Detail Forms**



PROJECT NUMBER 117612.G2.F2 WELL NUMBER PW01 SHEET 1 OF 1

## WELL COMPLETION DIAGRAM

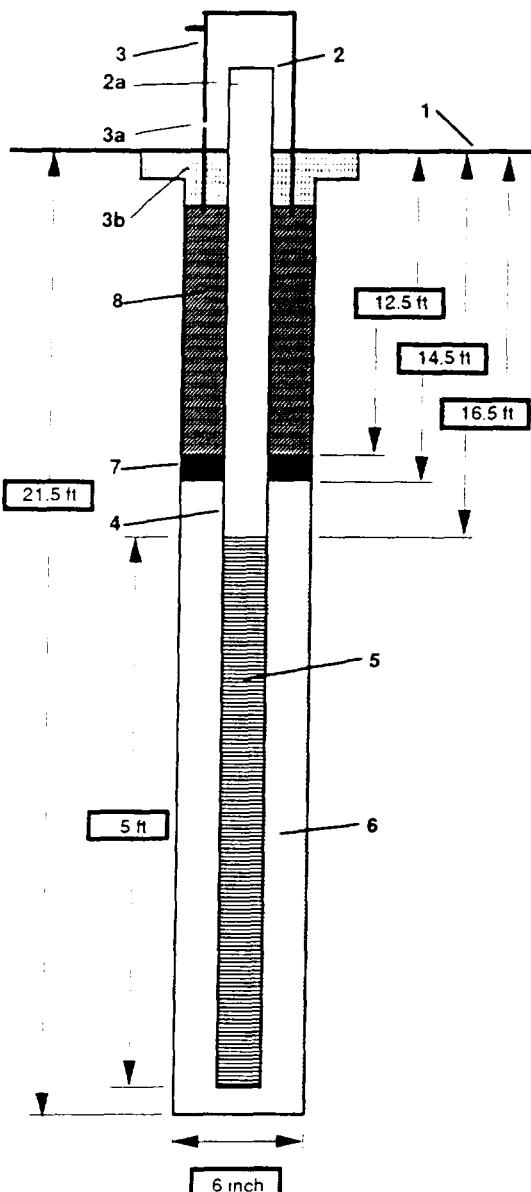
PROJECT : MARZONE SUPERFUND SITE

LOCATION : Tifton, Georgia

DRILLING CONTRACTOR : Ardaman & Associates, Inc., Tallahassee, FL

DRILLING METHOD AND EQUIPMENT USED : CME water rotary, 6-inch bit

WATER LEVELS : 343.33 ft NVGD 3/20/96 START : 1530 3/12/96 END : 1600 3/12/26 LOGGER : M. L. Weatherby



- 1- Pad elevation at well 346.49 ft NVGD
- 2- Top of casing elevation  
a) vent hole? no
- 3- Wellhead protection cover type 4"x4" above grade  
a) weep hole? yes  
b) concrete pad dimensions 4'x4'x6" concrete
- 4- Diameter/type of well casing 2-inch diameter, stainless steel, type 304, threaded
- 5- Type/slot size of screen 2-inch diameter, stainless steel, type 304, continuous wire wrapped, 10-slot
- 6- Type screen filter  
a) Quantity used silica sand, 20/30  
2-50 lb bags
- 7- Type of seal  
a) Quantity used Volclay bentonite pellets (1/4-inch)  
1/4 of 5-gallon bucket
- 8- Grout  
a) Grout mix used Portland with 5% bentonite  
b) Method of placement tremie pipe  
c) Quantity of well casing grout 1.5-90 lb bags
- Development method centrifugal pump and surge block
- Development time approximately 3 hours
- Estimated purge volume approximately 100 gallons
- Comments Located in the goat field south of the Marzone site, approximately 7 feet from MW-10D, and 7 feet from PZ03.



|                                |                     |
|--------------------------------|---------------------|
| PROJECT NUMBER<br>117612.G2.F2 | WELL NUMBER<br>PZ02 |
| SHEET 1 OF 1                   |                     |
| WELL COMPLETION DIAGRAM        |                     |

PROJECT : MARZONE SUPERFUND SITE

LOCATION : Titon, Georgia

DRILLING CONTRACTOR : Ardaman & Associates, Inc., Tallahassee, Fl.

DRILLING METHOD AND EQUIPMENT USED : CME water rotary, 6-inch bit

WATER LEVELS : 343.36 ft NVGD 3/20/96 START : 1330 3/12/96 END : 1500 3/12/26 LOGGER : M. L. Weatherby

|  |   |
|--|---|
|  | <p>1- Pad elevation at well <u>347.24 ft NVGD</u></p> <p>2- Top of casing elevation<br/>a) vent hole? <u>no</u></p> <p>3- Wellhead protection cover type <u>4"x4" above grade</u><br/>a) weep hole? <u>yes</u><br/>b) concrete pad dimensions <u>4'x4'x6" concrete</u></p> <p>4- Diameter/type of well casing <u>2-inch diameter, stainless steel, type 304, threaded</u></p> <p>5- Type/slot size of screen <u>2-inch diameter, stainless steel, type 304, continuous wire wrapped, 10-slot</u></p> <p>6- Type screen filter<br/>a) Quantity used <u>silica sand, 20/30<br/>2-50 lb bags</u></p> <p>7- Type of seal<br/>a) Quantity used <u>Volclay bentonite pellets (1/4-inch)<br/>1/4 of 5-gallon bucket</u></p> <p>8- Grout<br/>a) Grout mix used <u>Portland with 5% bentonite</u><br/>b) Method of placement <u>trame pipe</u><br/>c) Quantity of well casing grout <u>1.5-90 lb bags</u></p> <p>Development method <u>centrifugal pump and surge block</u></p> <p>Development time <u>approximately 3 hours</u></p> <p>Estimated purge volume <u>approximately 100 gallons</u></p> <p>Comments <u>Located in the goat field south of the Marzone site.<br/>approximately 7 feet NW from PZ03.</u></p> |
|--|---|



|                                       |                            |              |
|---------------------------------------|----------------------------|--------------|
| PROJECT NUMBER<br><b>117612.G2.F2</b> | WELL NUMBER<br><b>PZ03</b> | SHEET 1 OF 1 |
| <b>WELL COMPLETION DIAGRAM</b>        |                            |              |

PROJECT : MARZONE SUPERFUND SITE

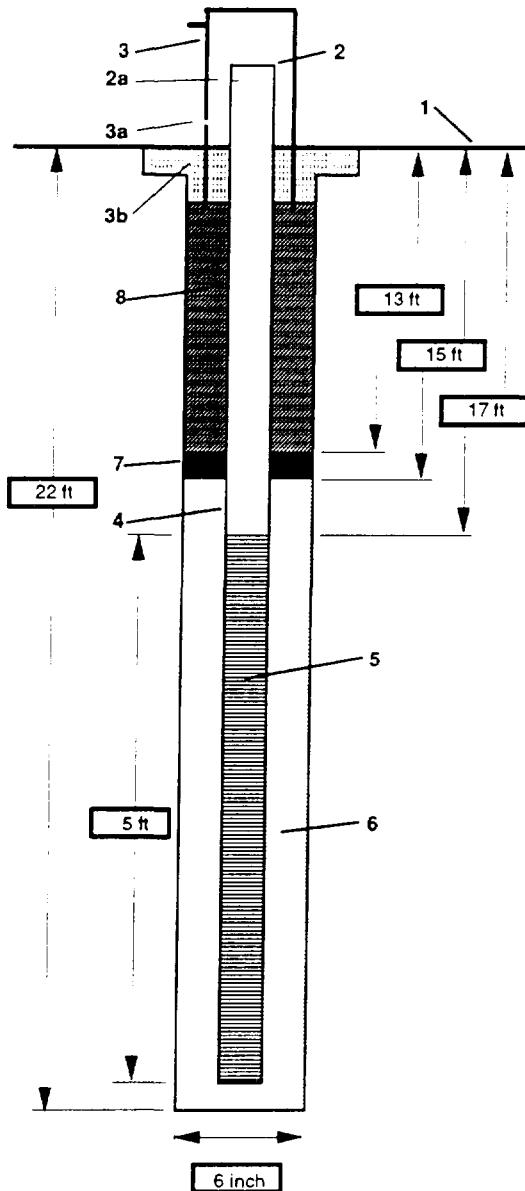
LOCATION : Tifton, Georgia

DRILLING CONTRACTOR : Ardaman &amp; Associates, Inc., Tallahassee, FL

DRILLING METHOD AND EQUIPMENT USED : CME water rotary, 6-inch bit

WATER LEVELS : 343.34 ft NVGD 3/20/96

START : 1740 3/11/96 END : 1840 3/11/26 LOGGER : M. L. Weatherby





PROJECT NUMBER

117612.G2.F2

WELL NUMBER

PZ04

SHEET 1 OF 1

## WELL COMPLETION DIAGRAM

PROJECT : MARZONE SUPERFUND SITE

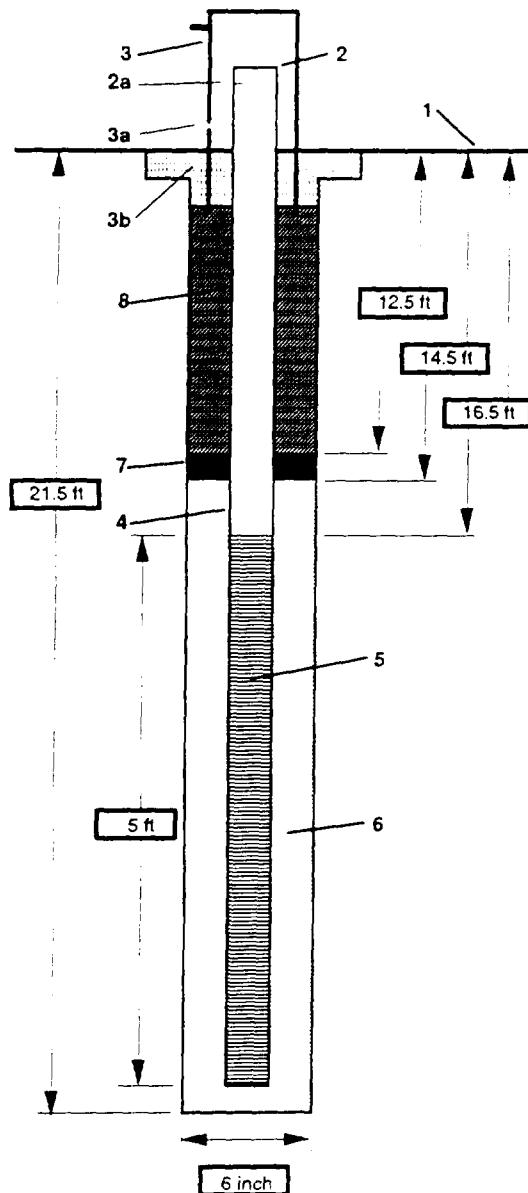
LOCATION : Tifton, Georgia

DRILLING CONTRACTOR : Ardaman &amp; Associates, Inc., Tallahassee, FL

DRILLING METHOD AND EQUIPMENT USED : CME water rotary, 6-inch bit

WATER LEVELS : 343.31 ft NVGD 3/20/96

START : 1050 3/12/96 END : 1115 3/12/26 LOGGER : M. L. Weatherby



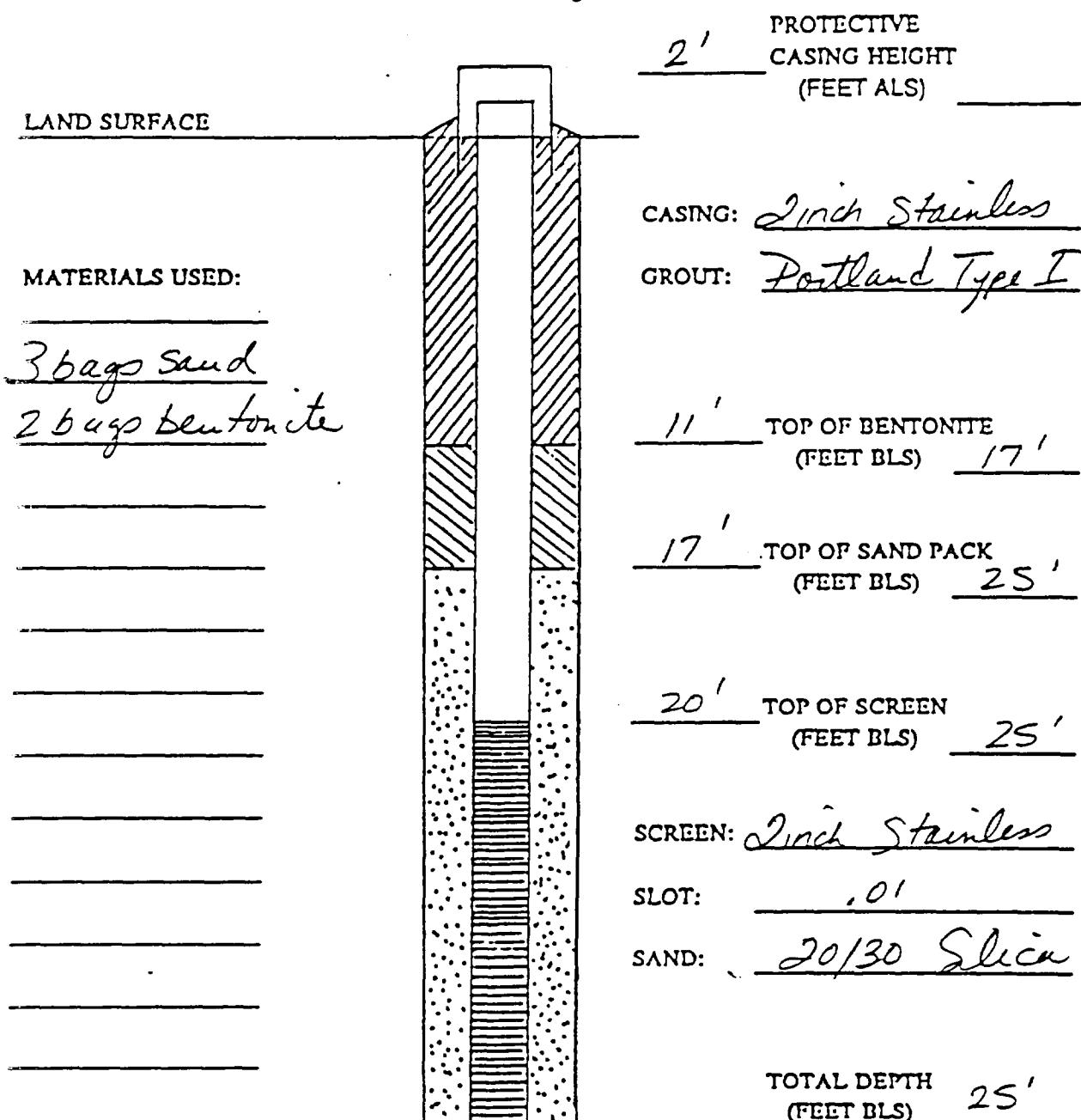
- 1- Pad elevation at well 346.68 ft NVGD
- 2- Top of casing elevation 349.85 ft NVGD  
a) vent hole? no
- 3- Wellhead protection cover type 4"x4" above grade  
a) weep hole? yes  
b) concrete pad dimensions 4'x4'x6" concrete
- 4- Diameter/type of well casing 2-inch diameter, stainless steel, type 304, threaded
- 5- Type/slot size of screen 2-inch diameter, stainless steel, type 304, continuous wire wrapped, 10-slot
- 6- Type screen filter silica sand, 20/30  
a) Quantity used 2-50 lb bags
- 7- Type of seal Volclay bentonite pellets (1/4-inch)  
a) Quantity used 1/4 of 5-gallon bucket
- 8- Grout  
a) Grout mix used Portland with 5% bentonite  
b) Method of placement tremie pipe  
c) Quantity of well casing grout 1.5-90 lb bags
- Development method centrifugal pump and surge block
- Development time approximately 3 hours
- Estimated purge volume approximately 100 gallons
- Comments Located in the goat field south of the Marzone site, approximately, 11 feet NE from PZ03, and 7 feet from PW01.

## WELL COMPLETION LOG

PROJECT: 5604

WELL NUMBER: MW-05-Deep

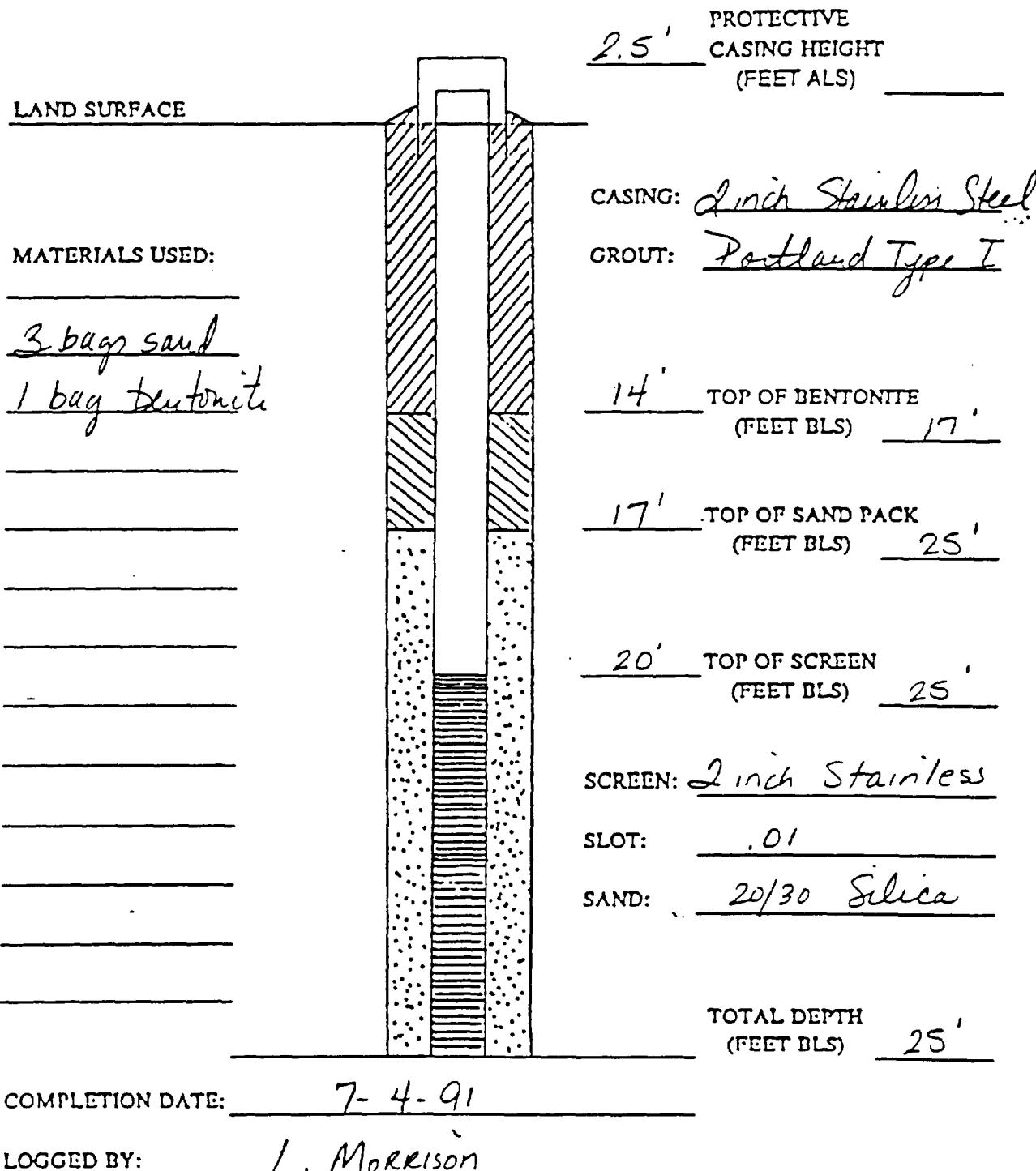
DRILLING METHOD: Hollow Stem Auger



COMPLETION DATE: 7-3-91

LOGGED BY: L. Morrison / R. Hastings

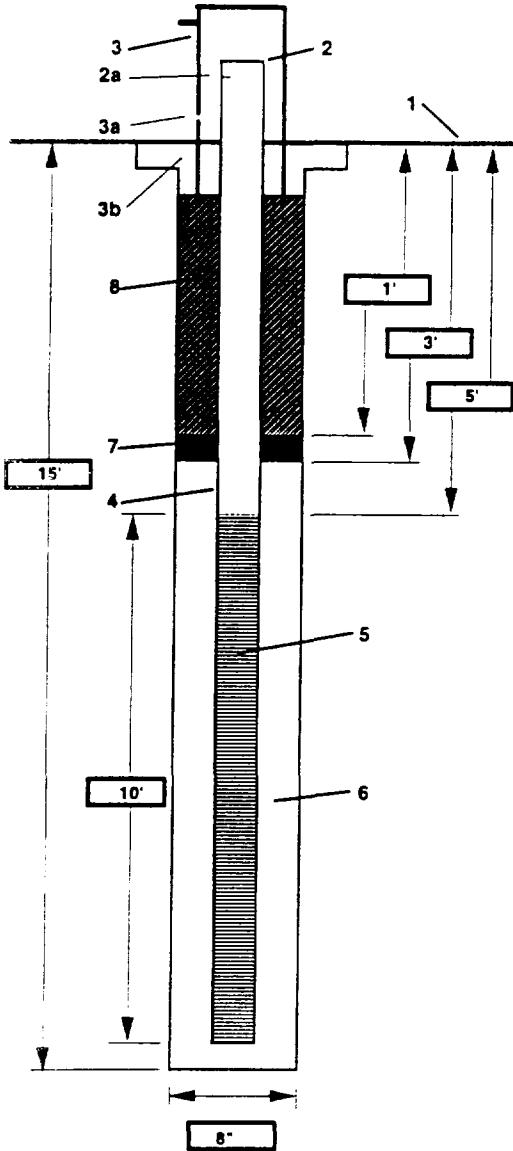
## WELL COMPLETION LOG

PROJECT: 5604WELL NUMBER: MW - 06 · DeepDRILLING METHOD: Hollow Stem Auger



|                                       |                                |              |
|---------------------------------------|--------------------------------|--------------|
| PROJECT NUMBER<br><b>117612.FF.RP</b> | WELL NUMBER<br><b>GFMW-10S</b> | SHEET 1 OF 1 |
| <b>WELL COMPLETION DIAGRAM</b>        |                                |              |

PRIO: 100011 MARZONE SITE INVESTIGATIONS LOCATION: GOATFIELD  
DRILLING CONTRACTOR: ARDAMAN & ASSOCIATES  
DRILLING METHOD AND EQUIPMENT USED: CME 55; 4-1/4" ID HOLLOW STEM AUGER  
WATER LEVELS: 338.87 FT NGVD 11/28/95 START: 11/6/95 END: 11/06/95 LOGGER: S. ROBERTI

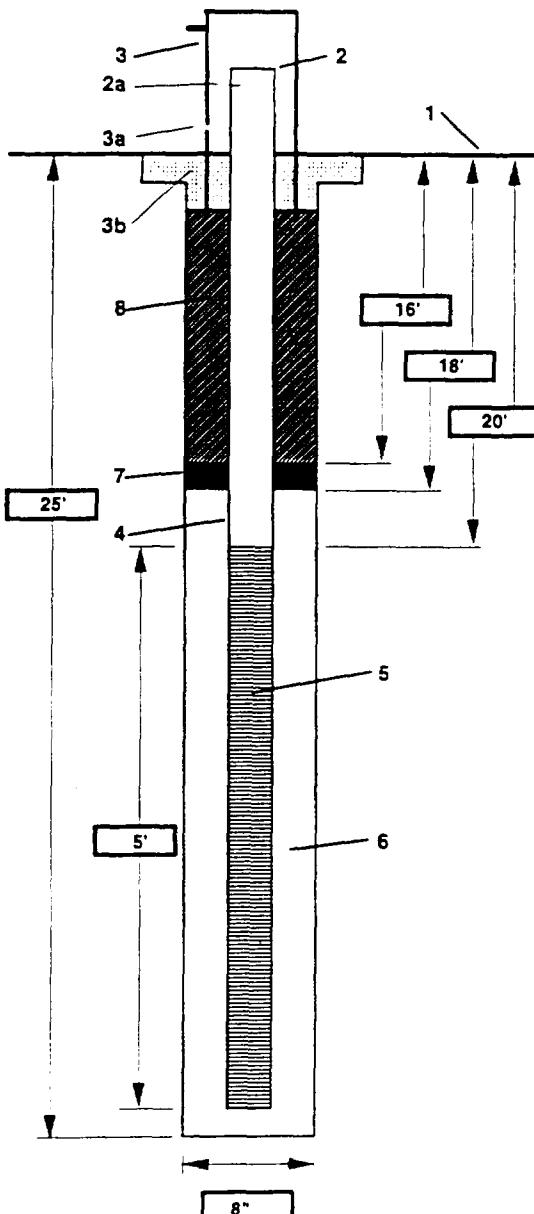


- 1- Ground elevation at well 346.6 FT NGVD  
2- Top of casing elevation  
a) vent hole? NONE  
3- Wellhead protection cover type  
a) weep hole? STEEL VAULT  
b) concrete pad dimensions NONE  
4- Diameter/type of well casing 2-inch NOMINAL; STAINLESS STEEL  
5- Type/slot size of screen 2-inch NOMINAL; STAINLESS STEEL  
0.010-inch SLOT SIZE, WIREWOUND  
6- Type screen filter  
a) Quantity used 20/30 QUARTZ SAND  
350 LB  
7- Type of seal  
a) Quantity used BENTONITE - 1/4-inch PELLETS  
N/C  
8- Grout  
a) Grout mix used TYPE I PORTLAND  
b) Method of placement POURED FROM SURFACE  
c) Quantity of well casing grout N/C  
Development method PERISTALTIC PUMP/BAILER  
Development time N/R  
Estimated purge volume 25 GAL  
Comments VERY SLOW PRODUCING WELL



|                                       |                                |              |
|---------------------------------------|--------------------------------|--------------|
| PROJECT NUMBER<br><b>117612.FF.RP</b> | WELL NUMBER<br><b>GFMW-10D</b> | SHEET 1 OF 1 |
| <b>WELL COMPLETION DIAGRAM</b>        |                                |              |

PROJECT : MARZONE SITE INVESTIGATIONS LOCATION : GOATFIELD  
DRILLING CONTRACTOR : ARDAMAN & ASSOCIATES  
DRILLING METHOD AND EQUIPMENT USED : CME 55; 4-1/4" ID HOLLOW STEM AUGER  
WATER LEVELS : 338.98 FT NGVD 11/28/95 START : 11/7/95 END : 11/07/95 LOGGER : S. ROBERTI

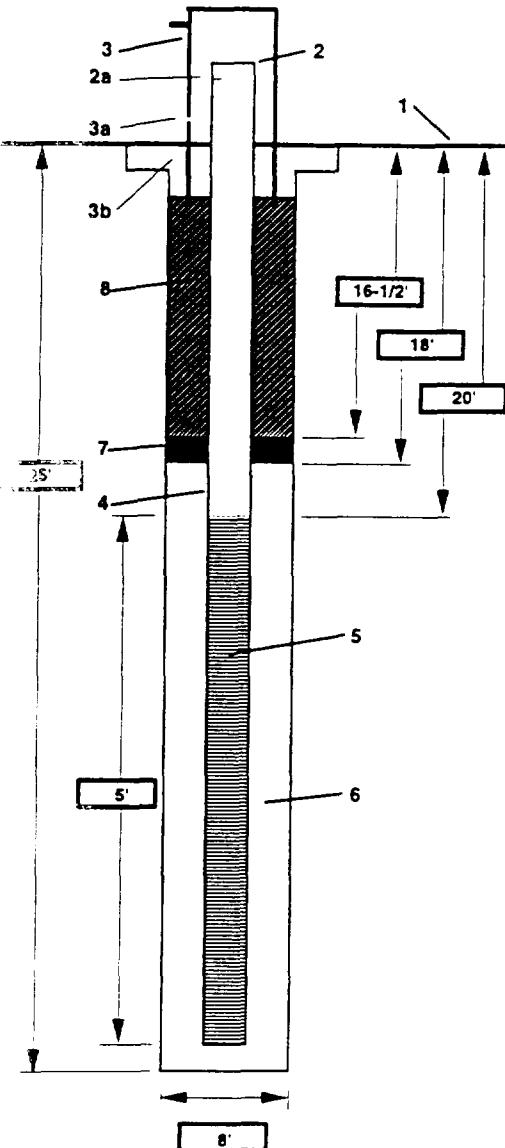


- |   |   |
|---|---|
| 1- Ground elevation at well   | <u>346.5 FT NGVD</u>  |
| 2- Top of casing elevation<br>a) vent hole?   | <u>349.42 FT NGVD</u><br><u>NONE</u>  |
| 3- Wellhead protection cover type<br>a) weep hole?<br>b) concrete pad dimensions            | <u>STEEL VAULT</u><br><u>NONE</u><br><u>4' x 6' x 4'</u>                        |
| 4- Diameter/type of well casing   | <u>2-inch NOMINAL: STAINLESS STEEL</u>  |
| 5- Type/slot size of screen   | <u>2-inch NOMINAL: STAINLESS STEEL</u><br><u>0.010-inch SLOT SIZE WIREWOUND</u> |
| 6- Type screen filter<br>a) Quantity used   | <u>20/30 QUARTZ SAND</u><br><u>225 LB</u>                                       |
| 7- Type of seal<br>a) Quantity used   | <u>1/4-inch BENTONITE PELLETS</u><br><u>N/C</u>                                 |
| 8- Grout<br>a) Grout mix used<br>b) Method of placement<br>c) Quantity of well casing grout | <u>TYPE I PORTLAND</u><br><u>TREMIE</u><br><u>N/C</u>                           |
| Development method  | <u>PERISTALTIC PUMP/BAILER</u>  |
| Development time  | <u>N/R</u>  |
| Estimated purge volume  | <u>25 GAL</u>   |
| Comments  | <u>VERY SLOW PRODUCING WELL</u>   |

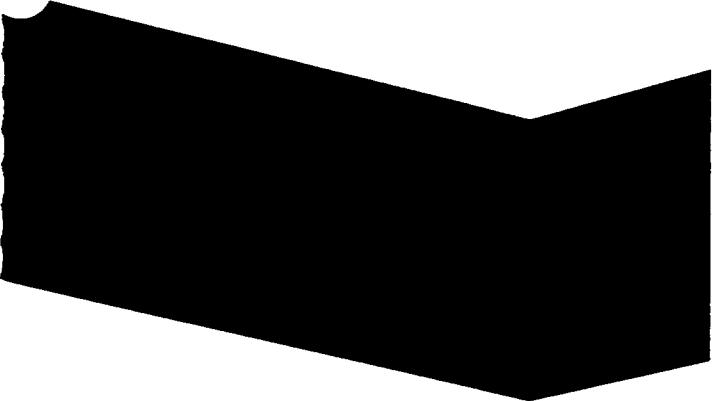


|                                |                         |              |
|--------------------------------|-------------------------|--------------|
| PROJECT NUMBER<br>117612.FF.RP | WELL NUMBER<br>RLMW-11D | SHEET 1 OF 1 |
| WELL COMPLETION DIAGRAM        |                         |              |

MARZONE SITE INVESTIGATIONS  
DRILLING CONTRACTOR : ARDAMAN & ASSOCIATES  
DRILLING METHOD AND EQUIPMENT USED : CME 55; 4-1/4" ID HOLLOW STEM AUGER  
WATER LEVELS : 341.58 FT NGVD 11/28/95      START : 11/8/95      END : 11/08/95      LOGGER : S. ROBERTI



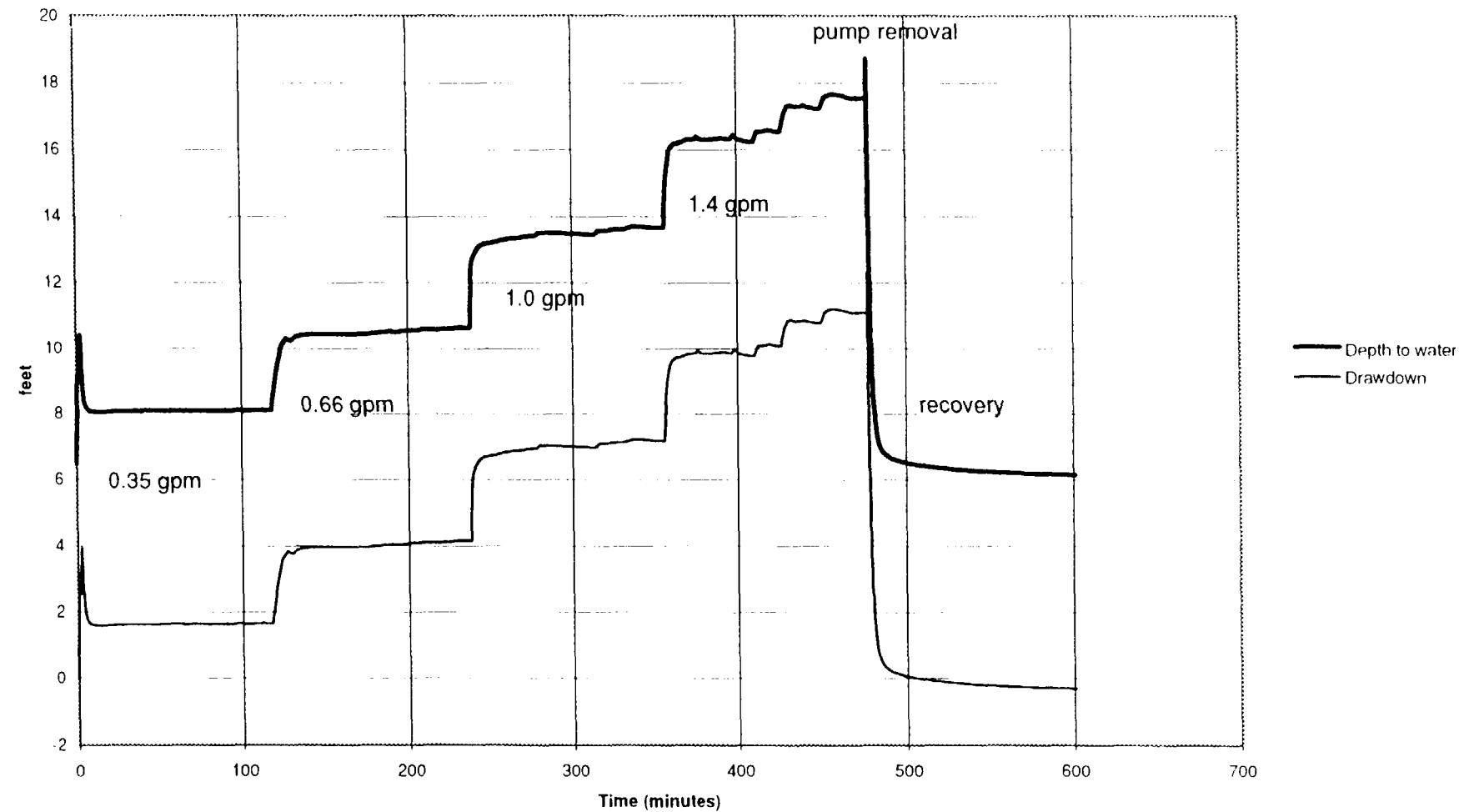
- 1- Ground elevation at well      347.4 FT NGVD
- 2- Top of casing elevation  
a) vent hole?      NONE
- 3- Wellhead protection cover type  
a) weep hole?  
b) concrete pad dimensions      STEEL VAULT  
NONE  
4' x 6' x 4'
- 4- Diameter/type of well casing      2-inch NOMINAL; STAINLESS STEEL
- 5- Type/slot size of screen      2-inch NOMINAL; STAINLESS STEEL  
0.010-inch SLOT SIZE, WIREWOUND
- 6- Type screen filter  
a) Quantity used      20/30 QUARTZ SAND  
225 LB
- 7- Type of seal  
a) Quantity used      1/4-inch BENTONITE PELLETS  
N/C
- 8- Grout  
a) Grout mix used      TYPE I PORTLAND  
b) Method of placement      TREMIE  
c) Quantity of well casing grout      N/C
- Development method      PERISTALTIC PUMP/BAILER
- Development time      N/R
- Estimated purge volume      25 GAL
- Comments      VERY SLOW PRODUCING WELL



## **Appendix D**

## **Step Test Results**

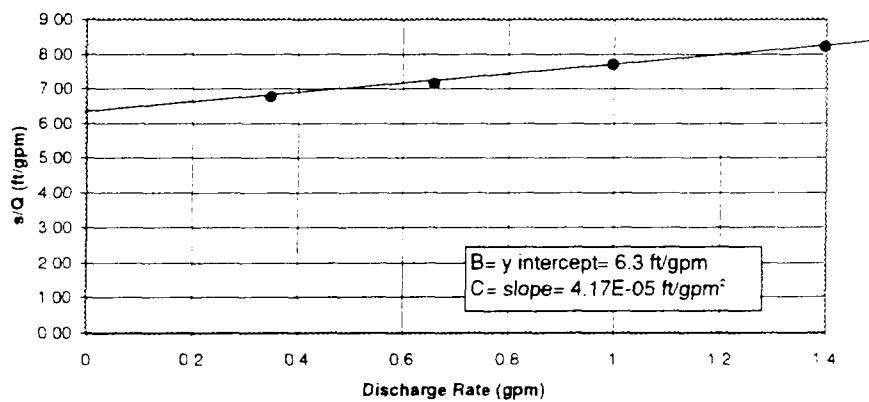
### PZ03 STEP TEST

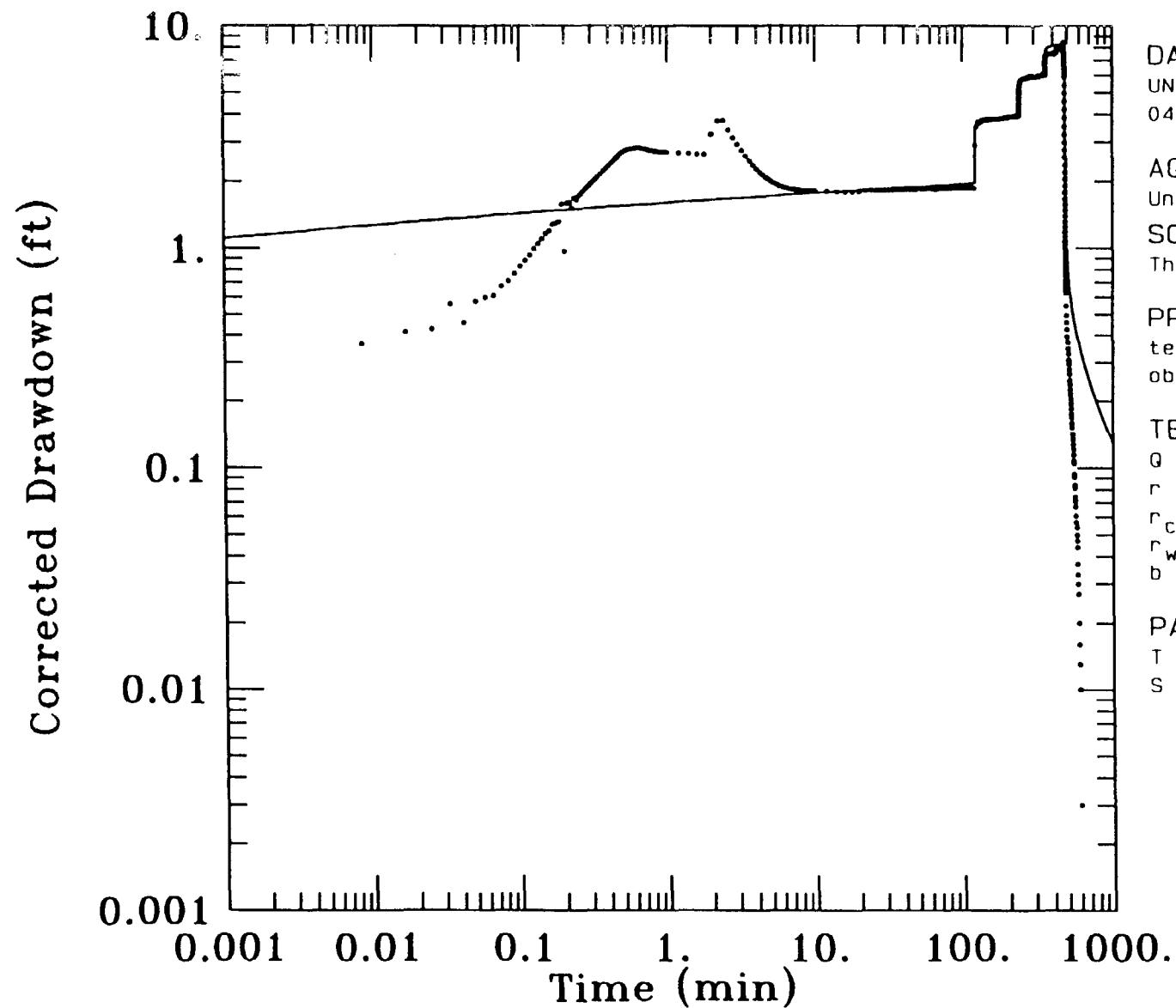


**Well PZ03 Step Drawdown Test**  
**March 19, 1996**

| Step | Pumping Rate (gpm) | Depth to Water (ft BTOP) | Observed Drawdown (ft) | Observed Specific Capacity (gpm/ft) | I/Specific Capacity (ft/gpm) |
|------|--------------------|--------------------------|------------------------|-------------------------------------|------------------------------|
|      | 0                  | 5.72                     | ---                    | ---                                 | ---                          |
| 1    | 0.35               | 8.08                     | 2.36                   | 0.15                                | 6.74                         |
| 2    | 0.66               | 10.43                    | 4.71                   | 0.14                                | 7.14                         |
| 3    | 1                  | 13.4                     | 7.68                   | 0.13                                | 7.68                         |
| 4    | 1.4                | 17.2                     | 11.48                  | 0.12                                | 8.20                         |

| Step | Coefficient B (ft/gpm) | Well Loss Coefficient, C (ft/gpm <sup>2</sup> ) | Well Loss (ft) | Percent of head loss from laminar flow (%) |
|------|------------------------|---|----------------|--|
|      | ---                    | ---   | ---            | ---  |
| 1    | 6.3                    | 4.17E-05  | 5.11E-06       | 100  |
| 2    | 6.3                    | 4.17E-05  | 1.82E-05       | 100  |
| 3    | 6.3                    | 4.17E-05  | 4.17E-05       | 100  |
| 4    | 6.3                    | 4.17E-05  | 8.17E-05       | 100  |





DATA SET:  
UNAQSTEP.DAT  
04/02/96

AQUIFER MODEL:  
Unconfined

SOLUTION METHOD:  
Theis

PROJECT DATA:  
test well: PZ03  
obs. well: PZ03

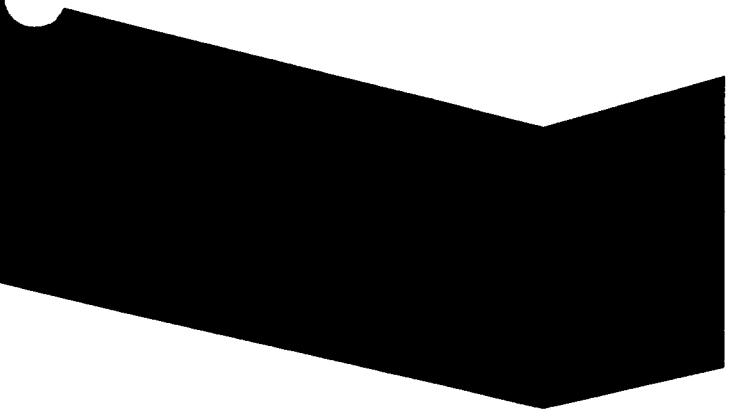
TEST DATA:  
 $Q = 0.34 \text{ gal/min}$   
 $r = 0. \text{ ft}$   
 $r_c = 0.083 \text{ ft}$   
 $r_w = 0.5 \text{ ft}$   
 $b = 19.17 \text{ ft}$

PARAMETER ESTIMATES:  
 $T = 533.6 \text{ gal/day/ft}$   
 $S = 1.196E-10$



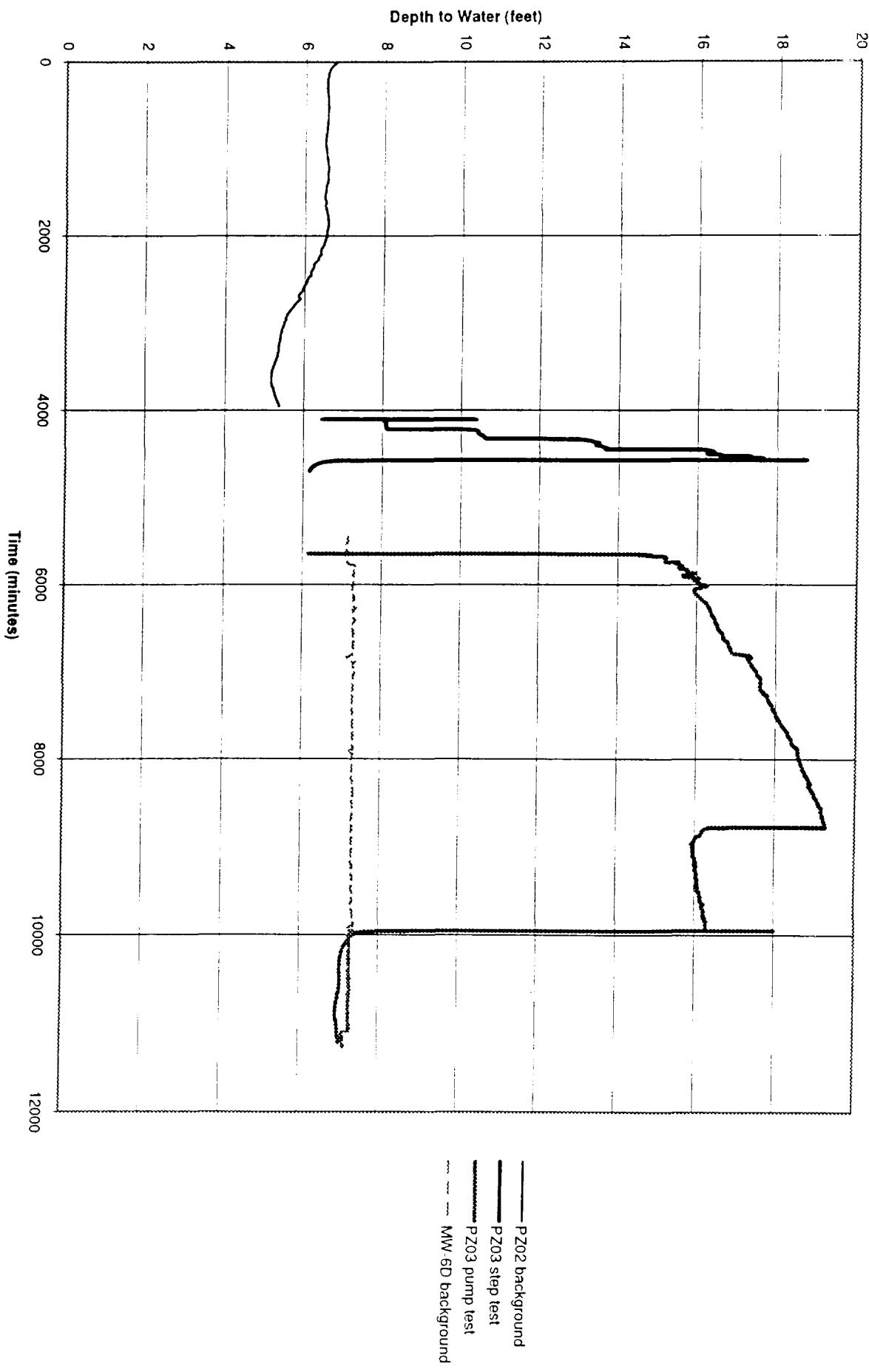
## **Appendix E Water Level Data**

**Water level data, as recorded by the onsite environmental logger,  
are on diskette in Appendix E.**

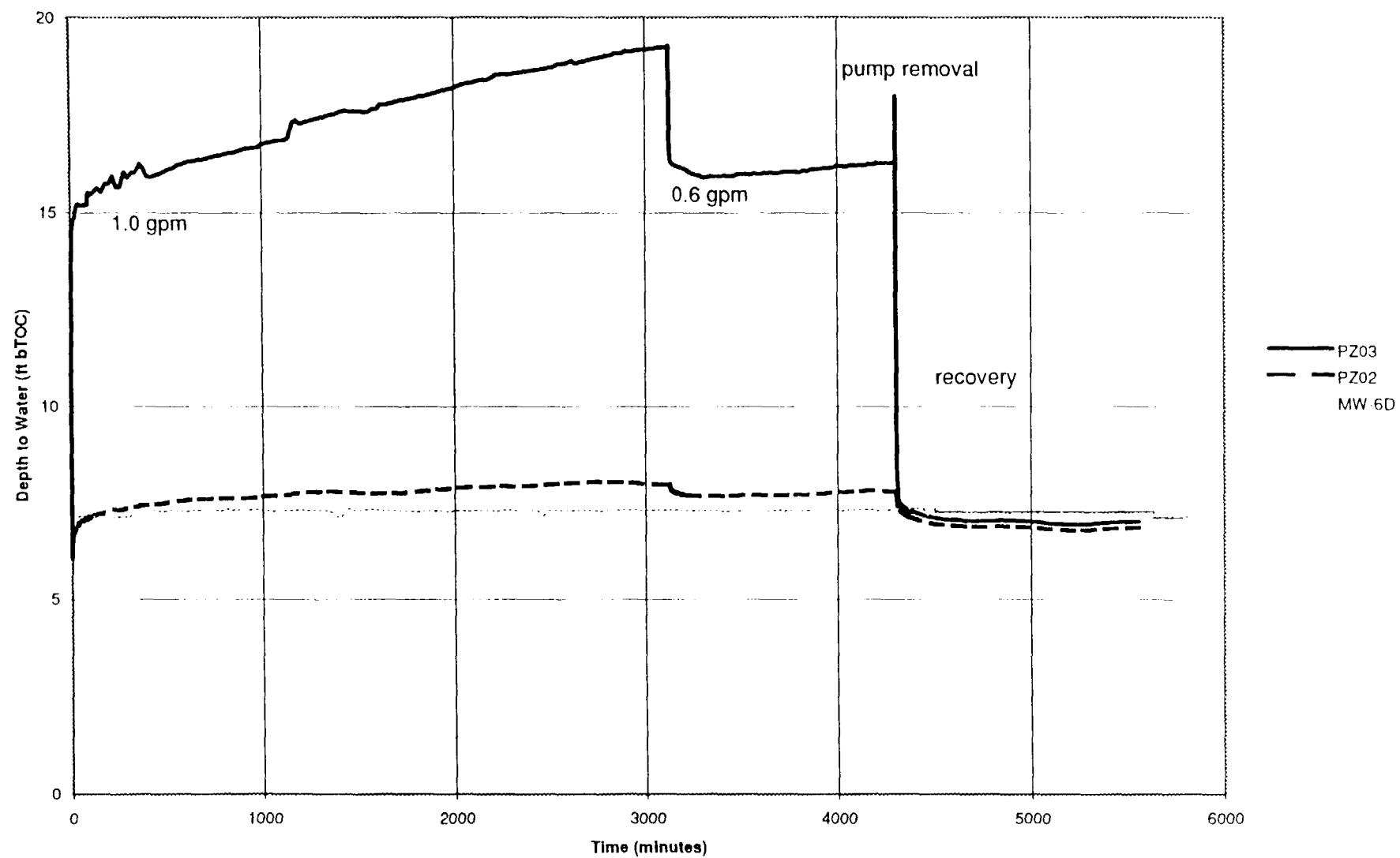


## **Appendix F Aquifer Test Results**

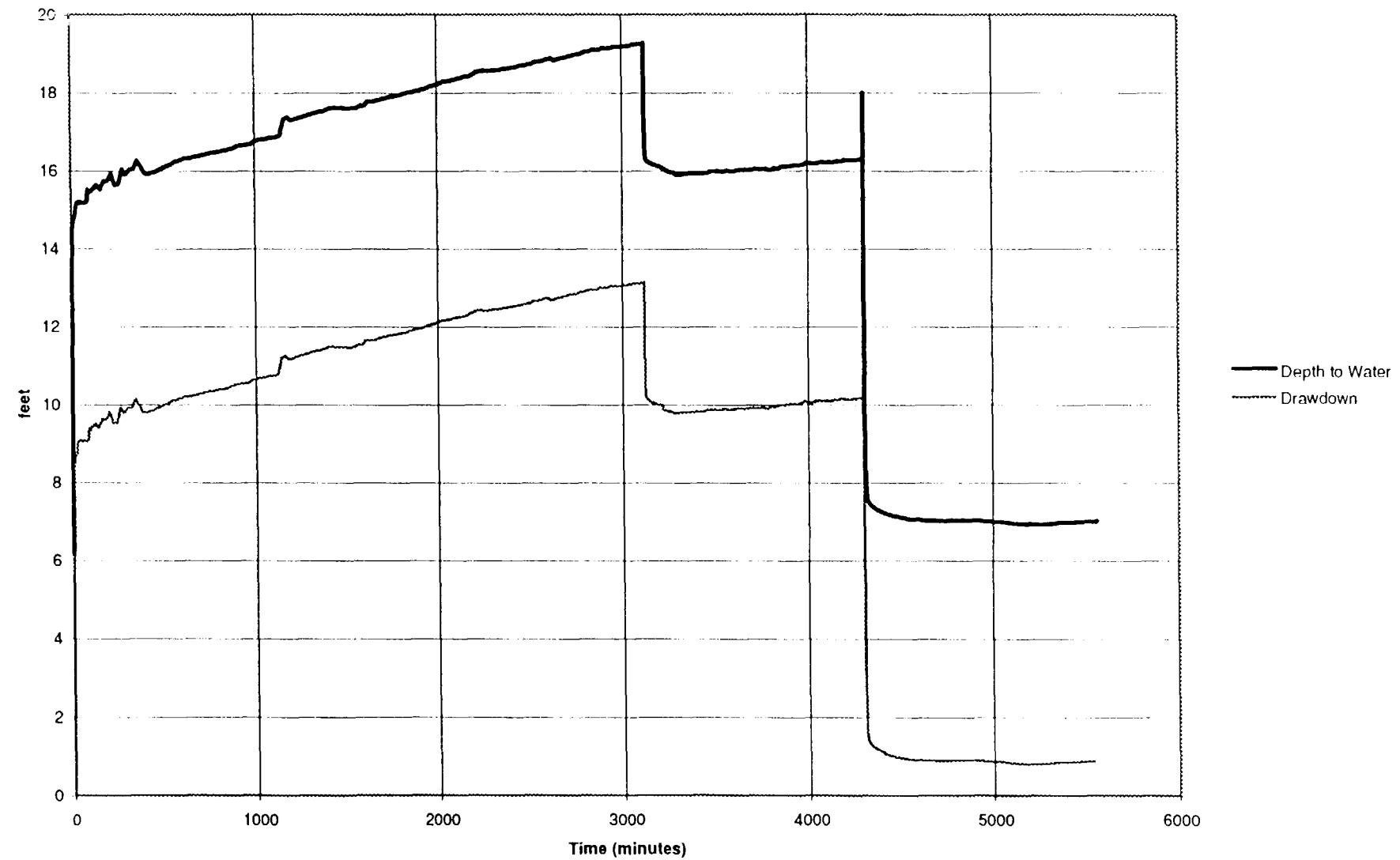
## Chronology of Aquifer Testing



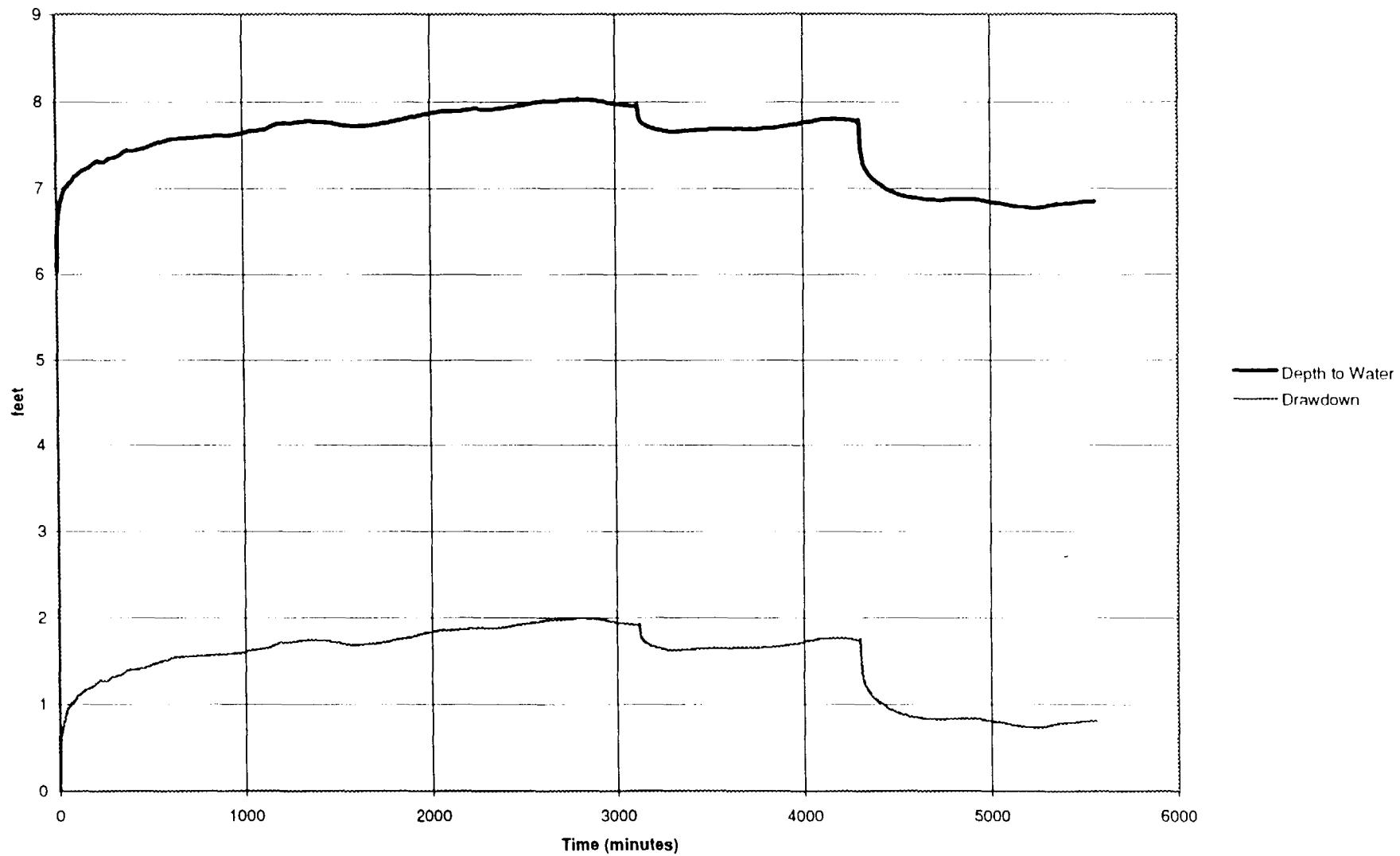
PZ03 PUMPING TEST



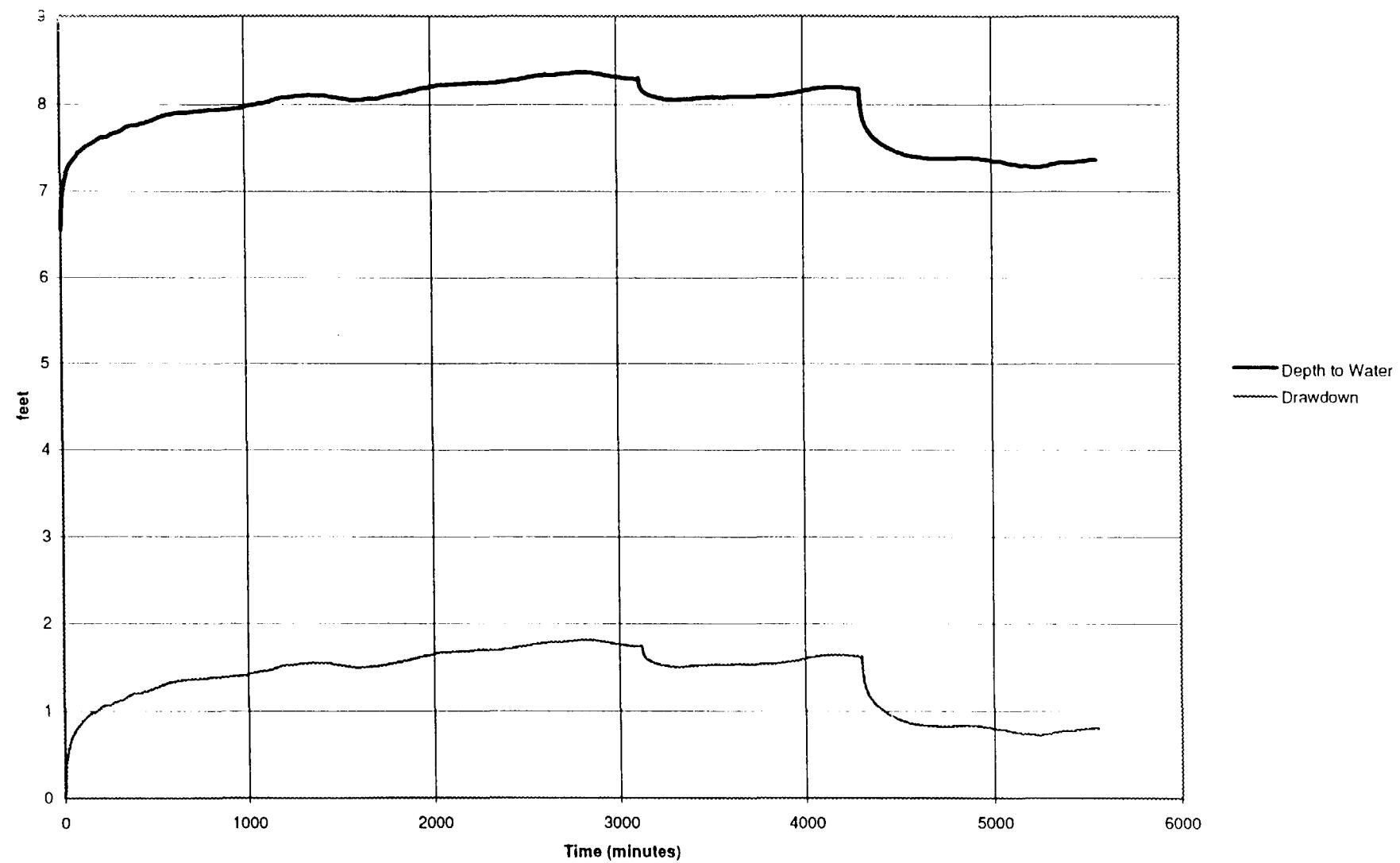
PZ03 (pumping well)



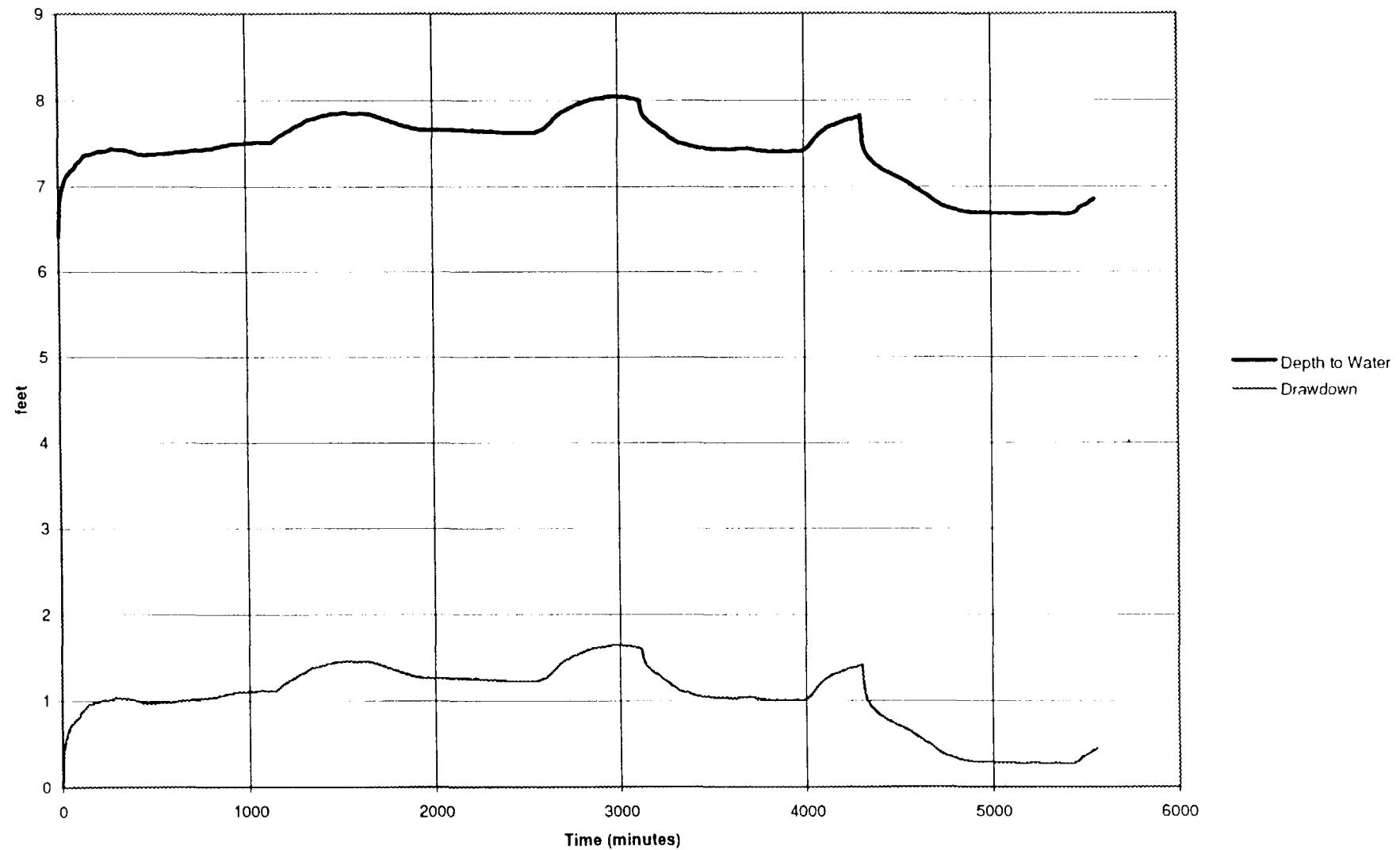
PZ02 (observation well)



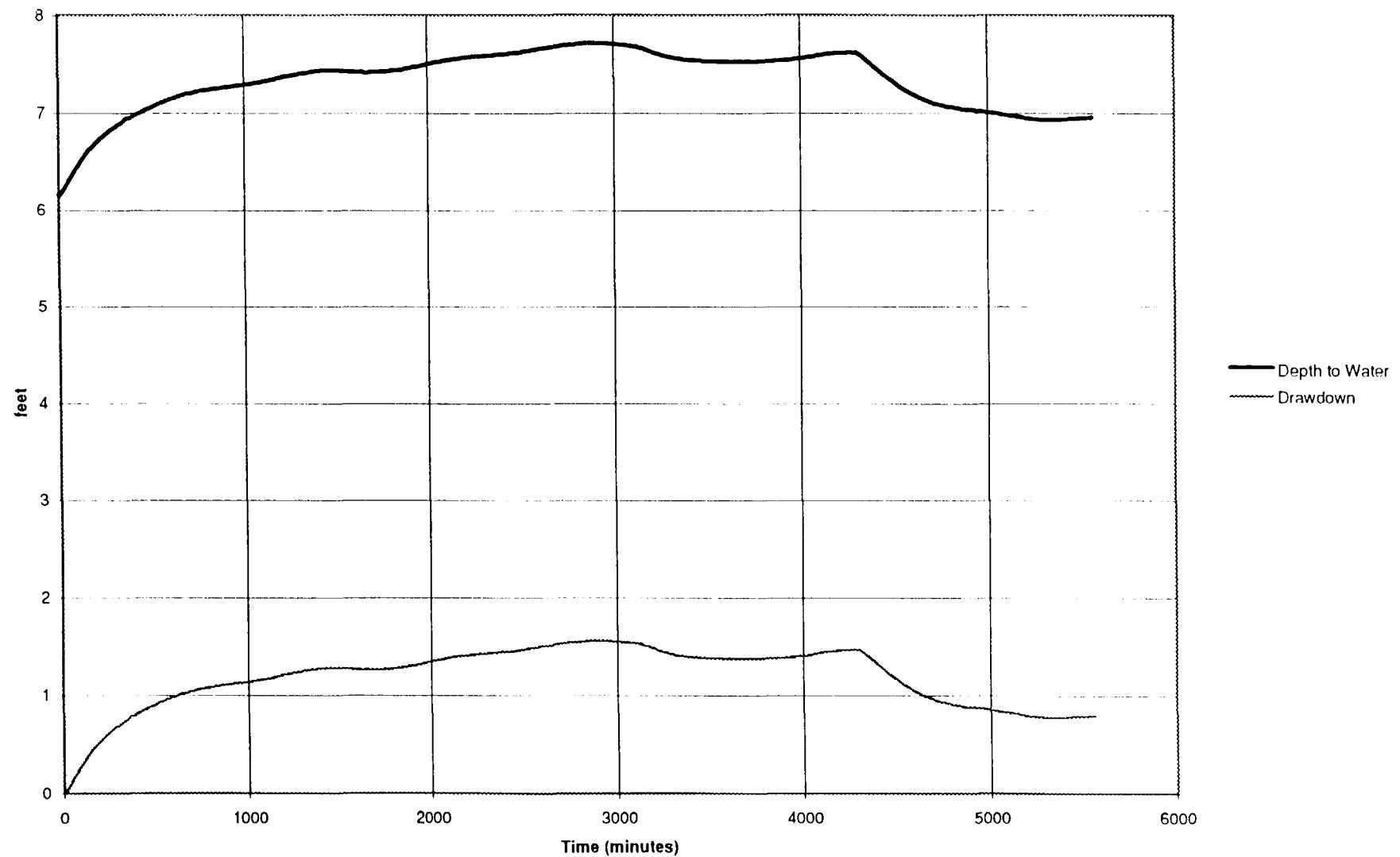
PZ04 (observation well)



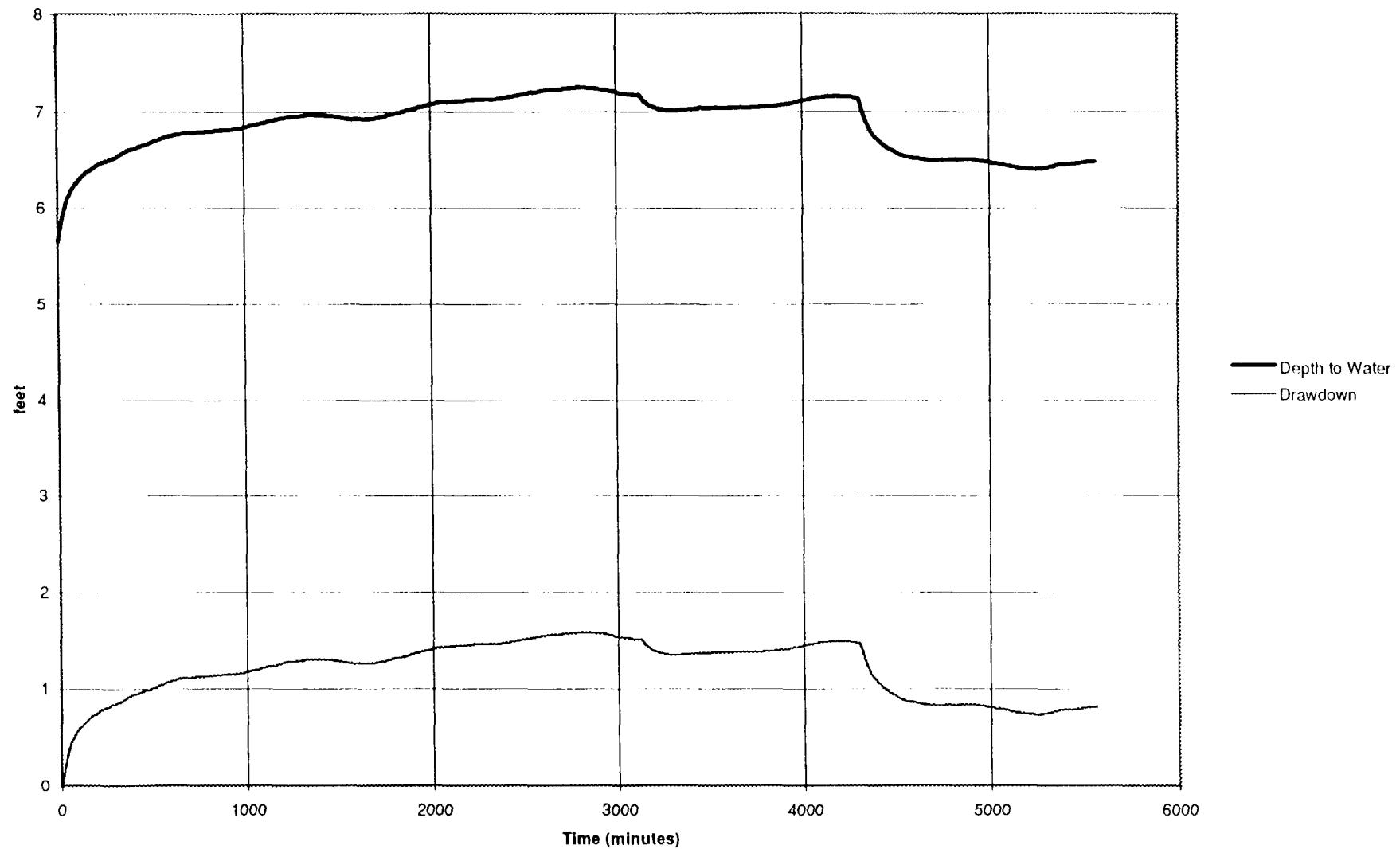
PW01 (observation well)



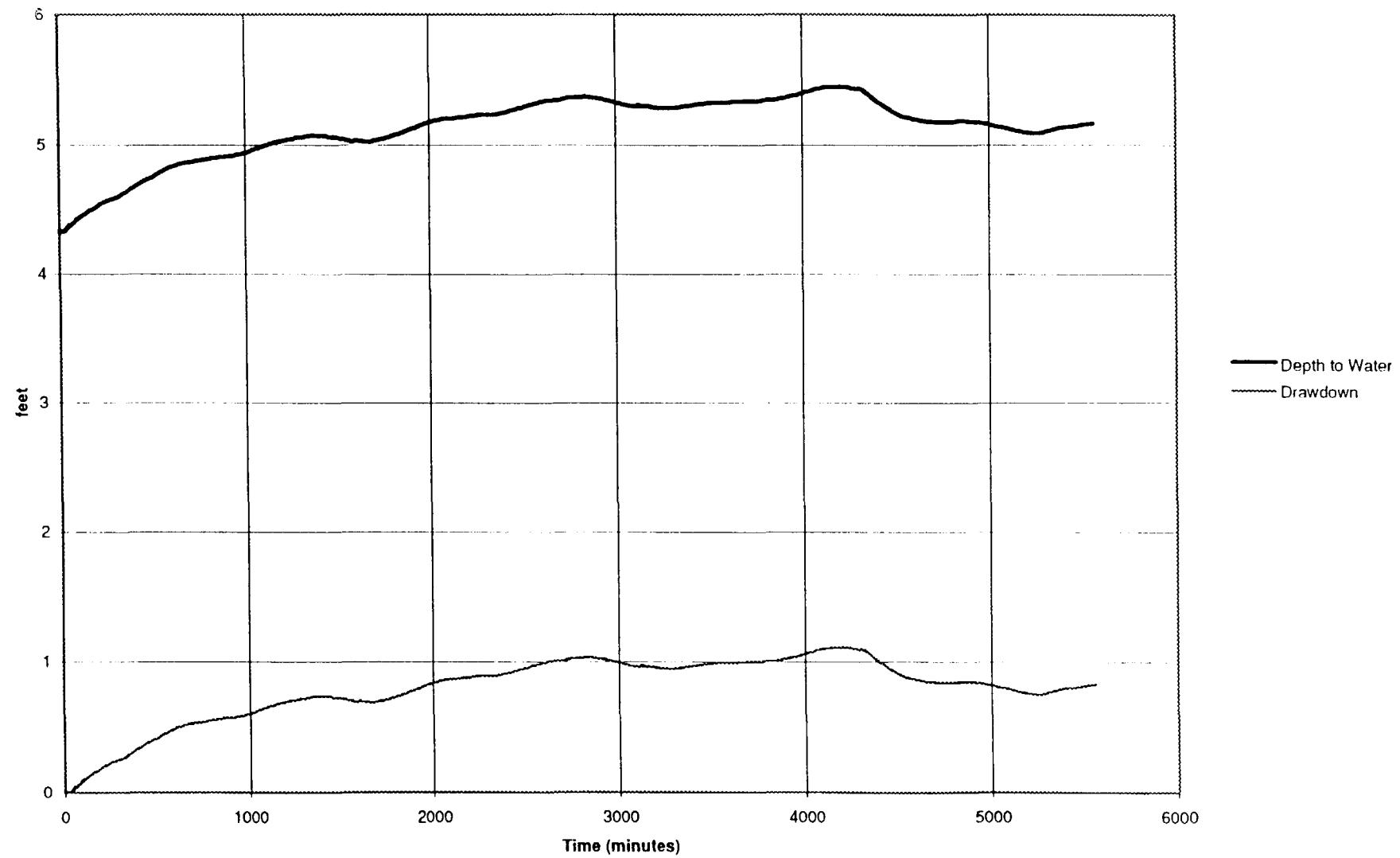
MW-10D (observation well)



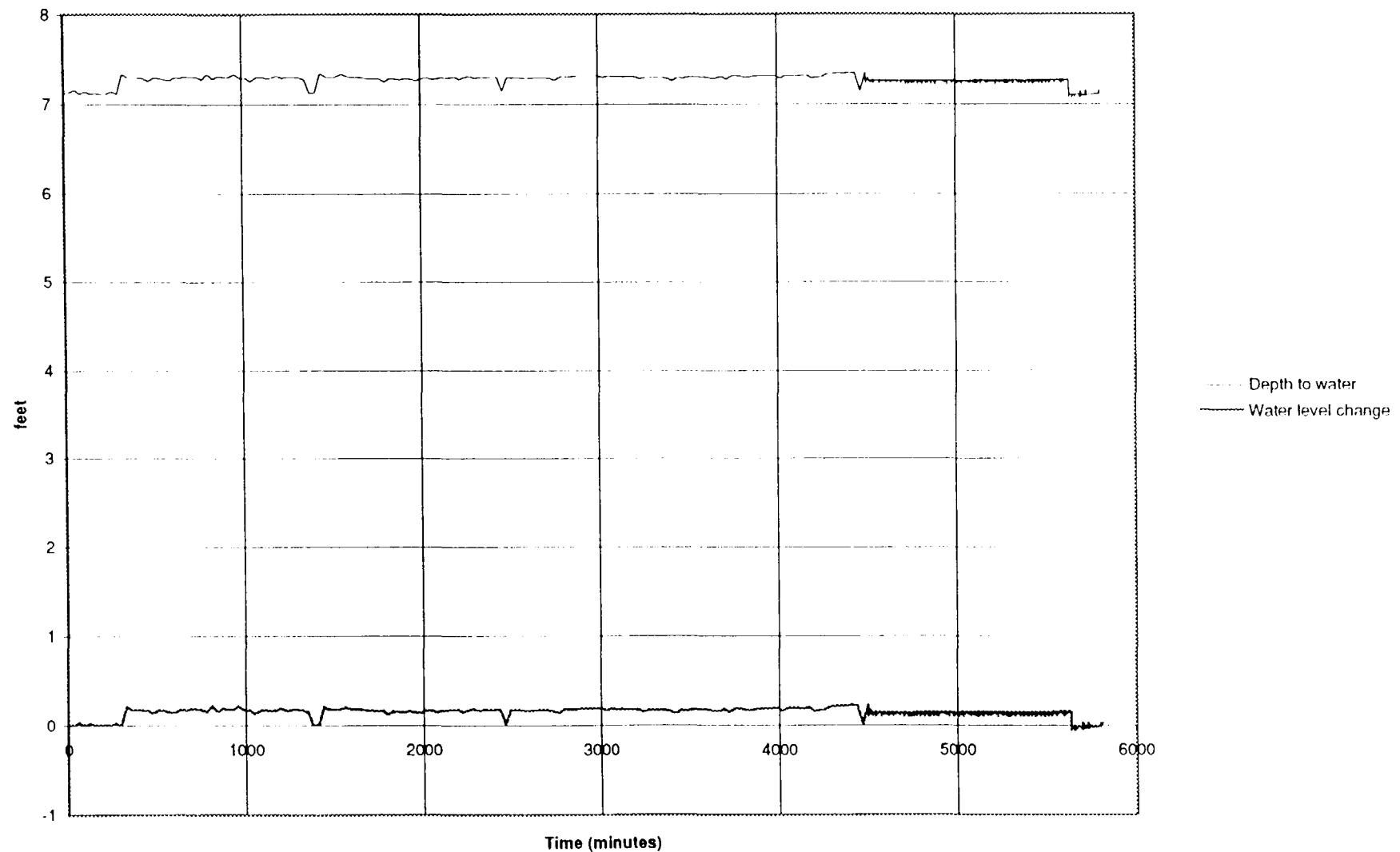
### MW-10S (observation well)



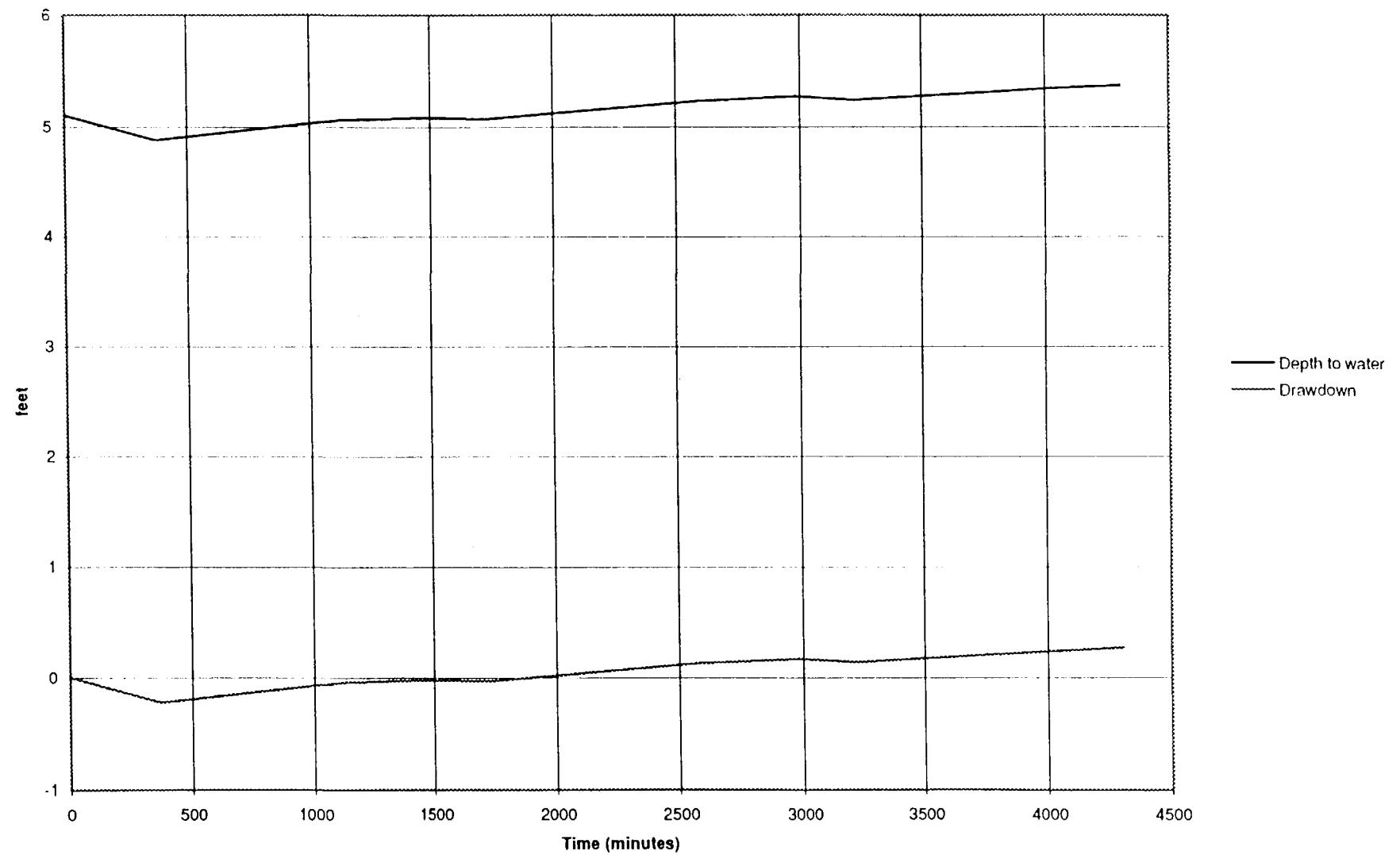
### MW-5D (observation well)



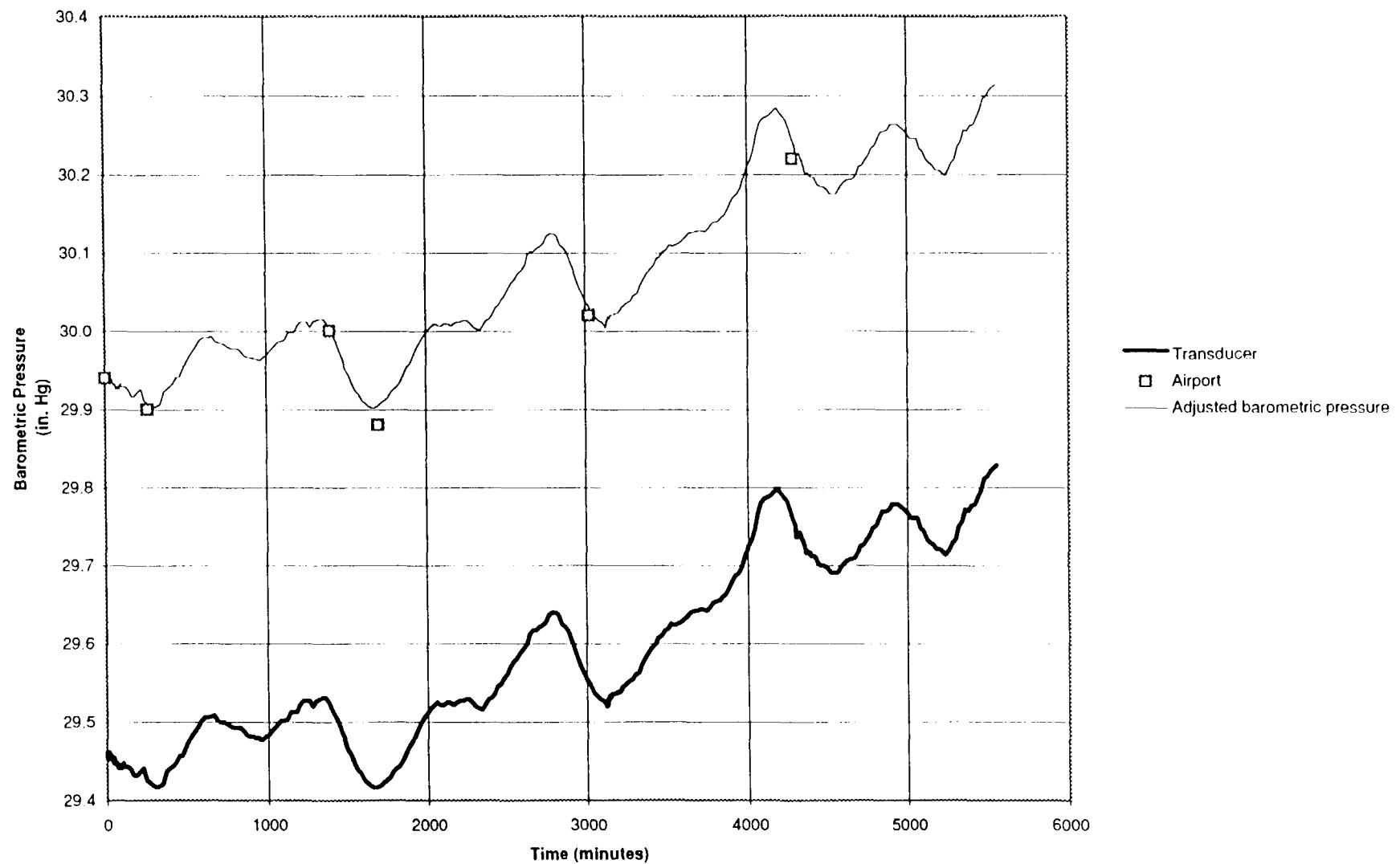
### MW-6D (background water levels)



**MW-11D (observation well)**



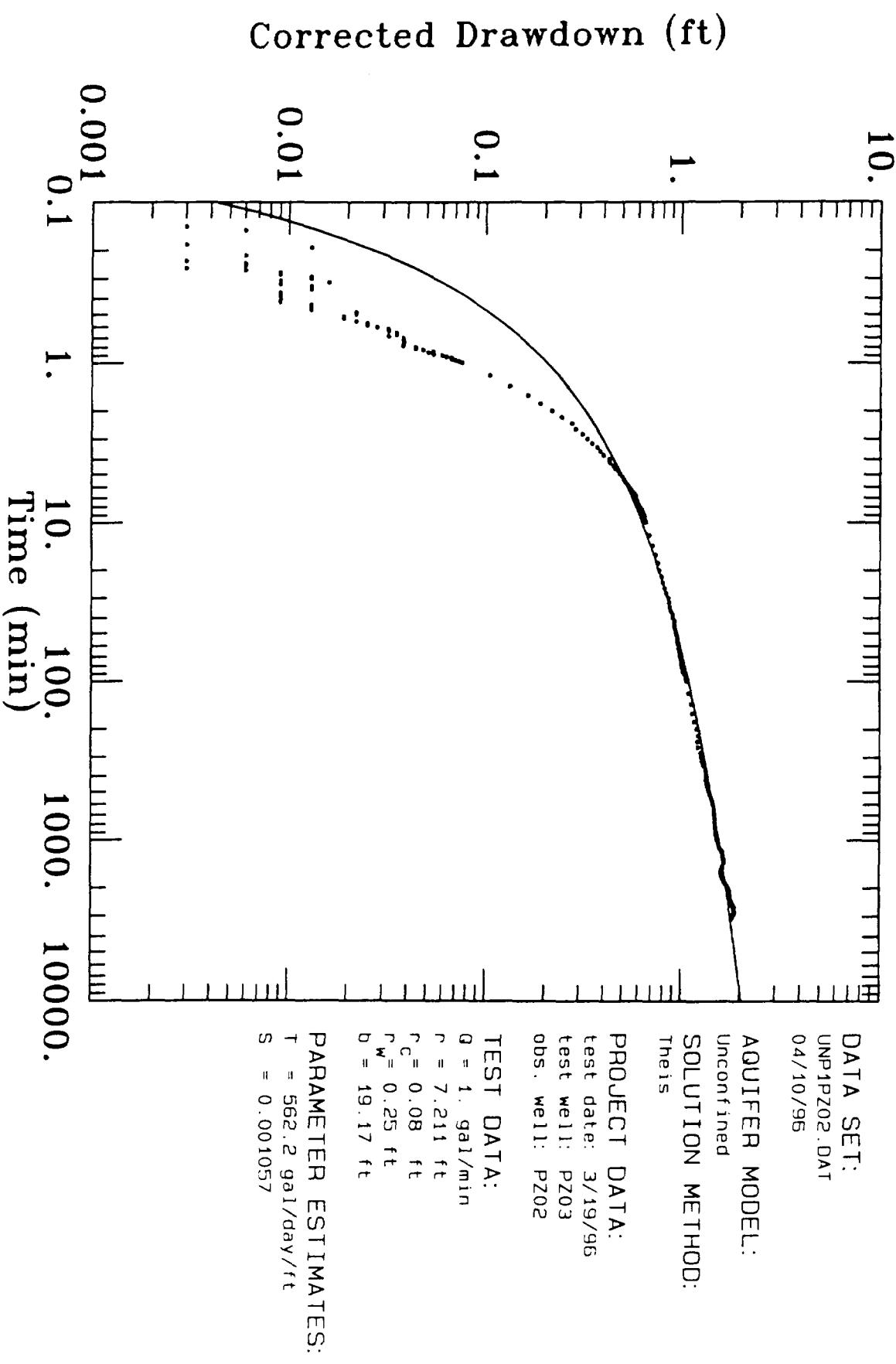
Barometric Pressure  
during PZ03 Pumping Test

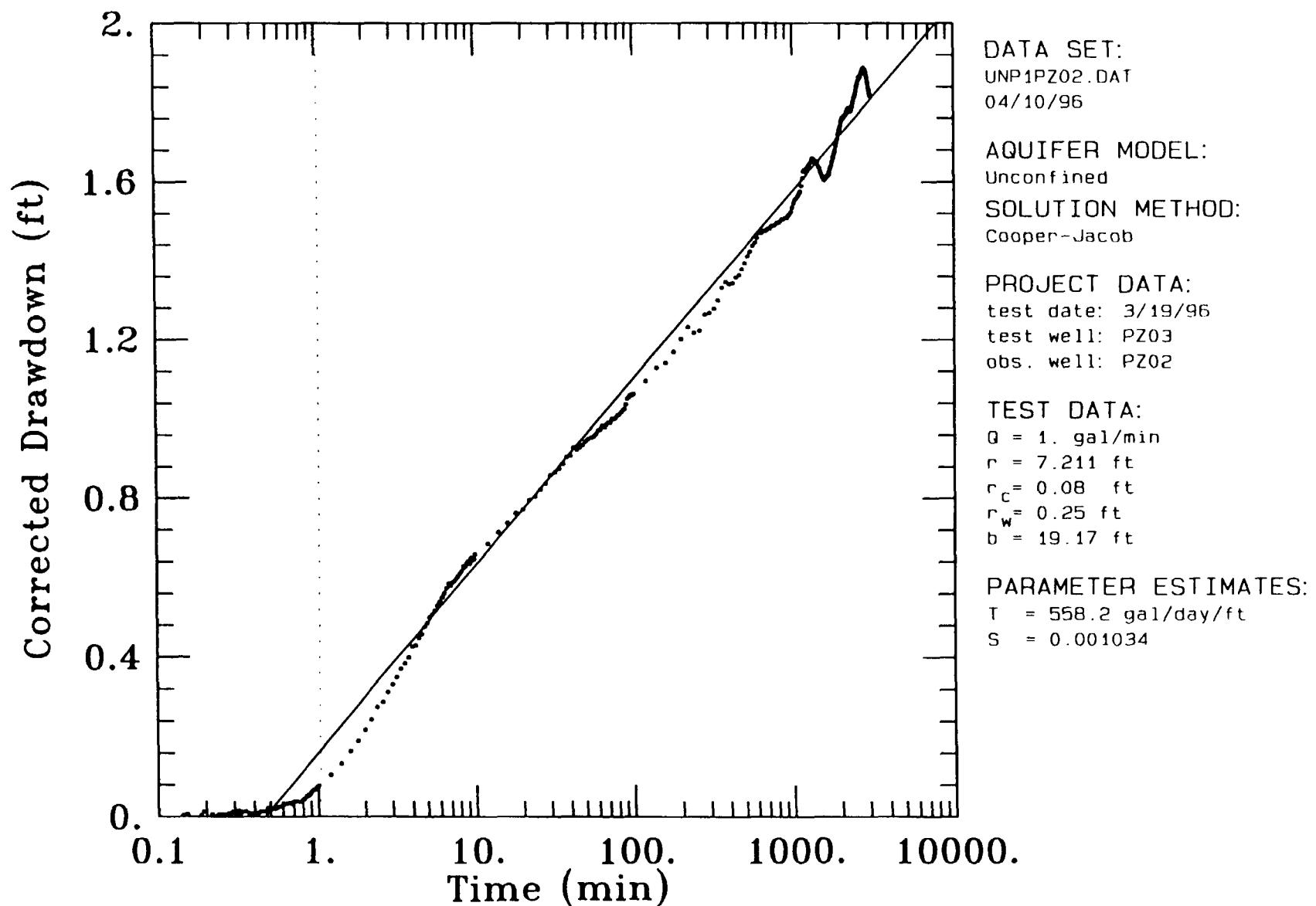


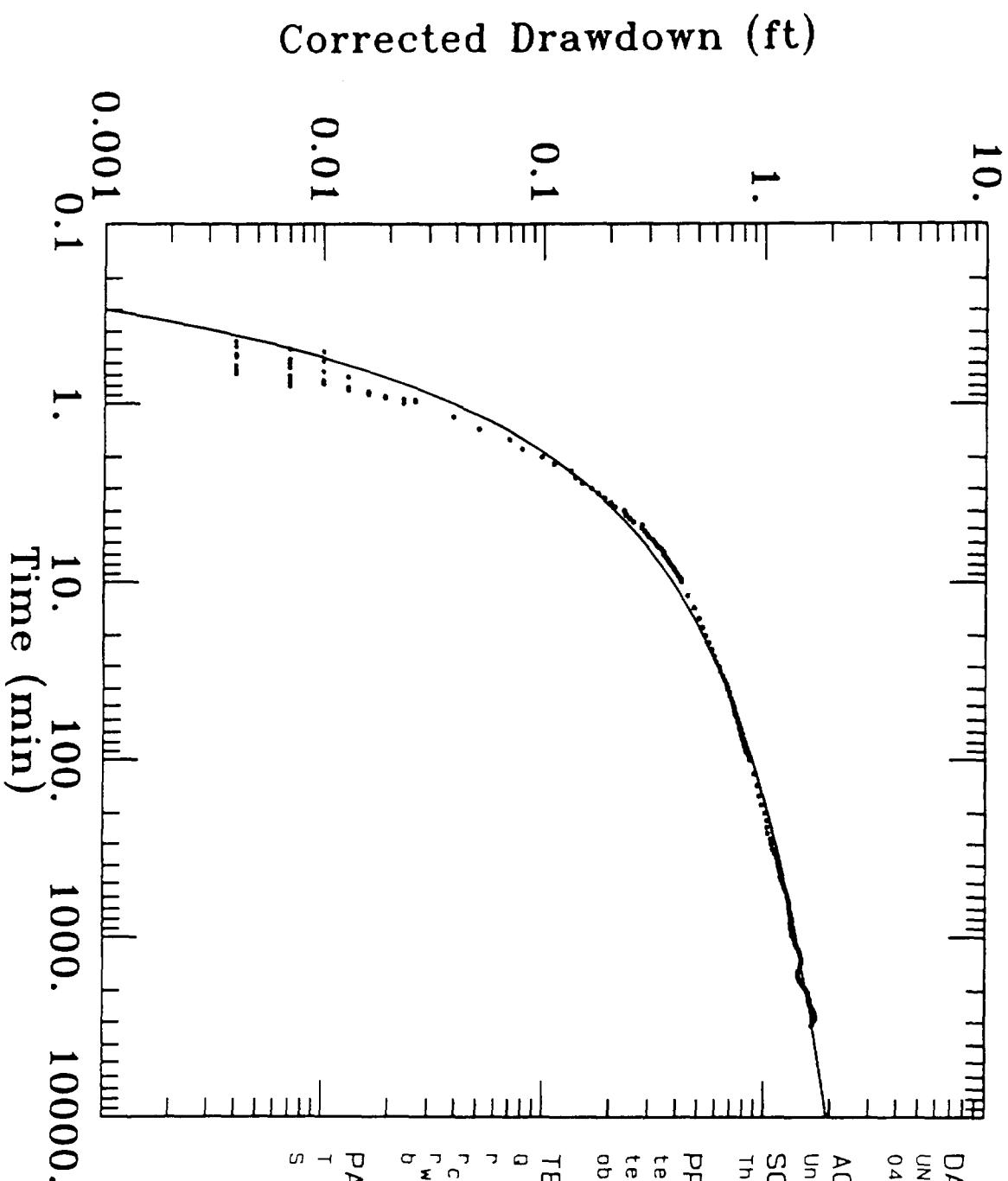
PZ-03 Aquifer Test Results  
 March 19-24, 1996

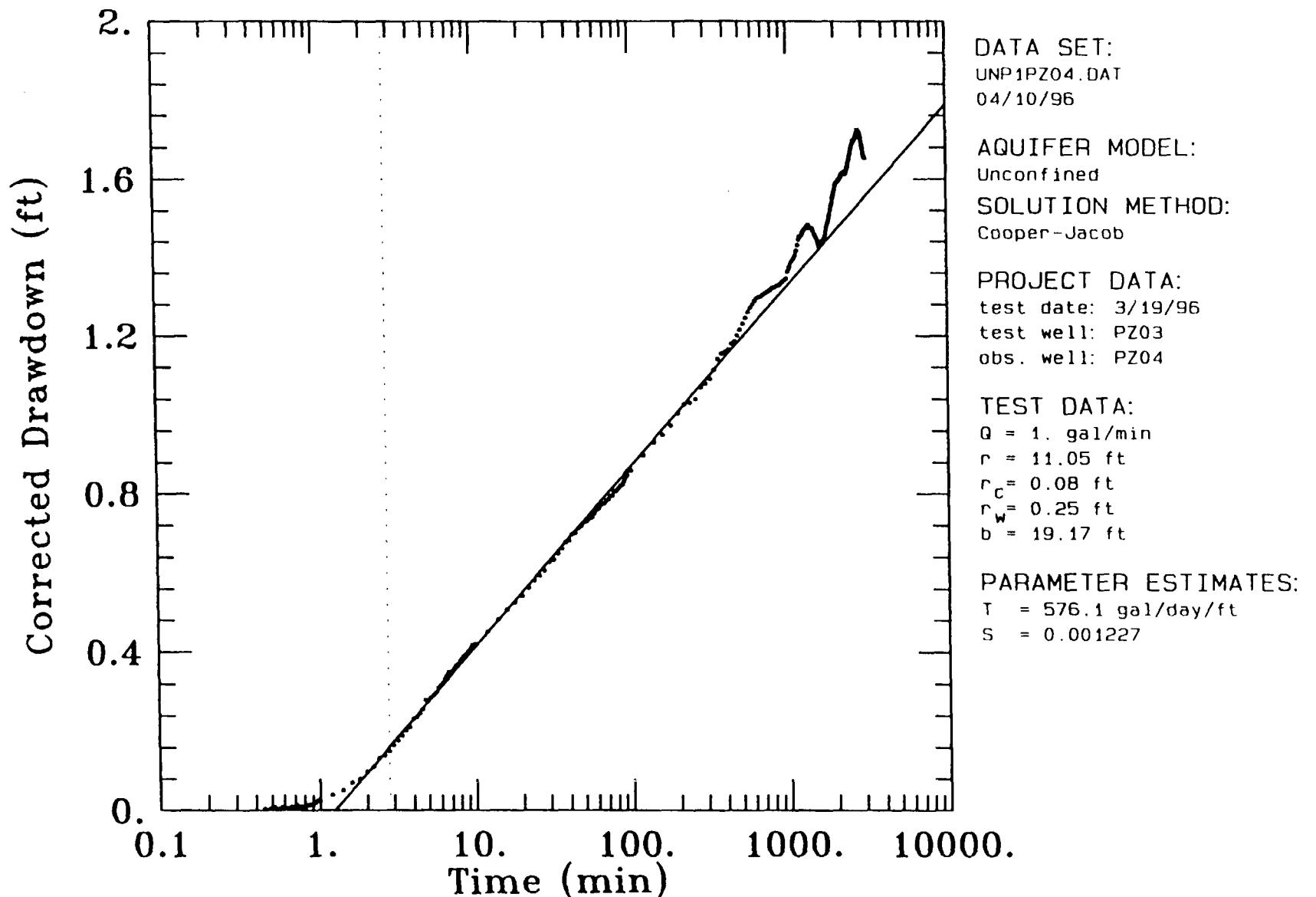
| <b>Analysis Well</b> | <b>Analysis Method</b> | <b>Transmissivity<br/>(gpd/ft)</b> | <b>Transmissivity<br/>(ft<sup>2</sup>/day)</b> | <b>Storativity</b> |
|----------------------|------------------------|------------------------------------|--|--------------------|
| PZ-02                | Theis                  | 562                                | 75   | 0.001              |
|                      | Cooper-Jacob           | 558                                | 75   | 0.001              |
|                      | Recovery (Theis)       | 424                                | 57   | 0.02               |
| PZ-04                | Theis                  | 505                                | 68   | 0.002              |
|                      | Cooper-Jacob           | 576                                | 77   | 0.001              |
|                      | Recovery (Theis)       | 395                                | 53   | 0.02               |
| PW-01                | Theis                  | 616                                | 82   | 0.004              |
|                      | Cooper-Jacob           | 645                                | 86   | 0.002              |
|                      | Recovery (Theis)       | 576                                | 77   | 0.01               |
| MW-5D                | Theis                  | 387                                | 52   | 0.001              |
|                      | Cooper-Jacob           | 370                                | 49   | 0.001              |
|                      | Recovery (Theis)       | 233                                | 31   | 0.002              |
| MW-10S               | Theis                  | 422                                | 56   | 0.01               |
|                      | Cooper-Jacob           | 457                                | 61   | 0.007              |
|                      | Recovery (Theis)       | 339                                | 45   | 0.04               |
| MW-10D               | Theis                  | 309                                | 41   | 0.02               |
|                      | Cooper-Jacob           | 319                                | 43   | 0.02               |
|                      | Recovery (Theis)       | 259                                | 35   | 0.06               |
| Step Test            | Theis                  | 534                                | 71   | ---                |
| <b>Averages</b>      |                        | <b>447</b>                         | <b>60</b>                                      | <b>0.012</b>       |

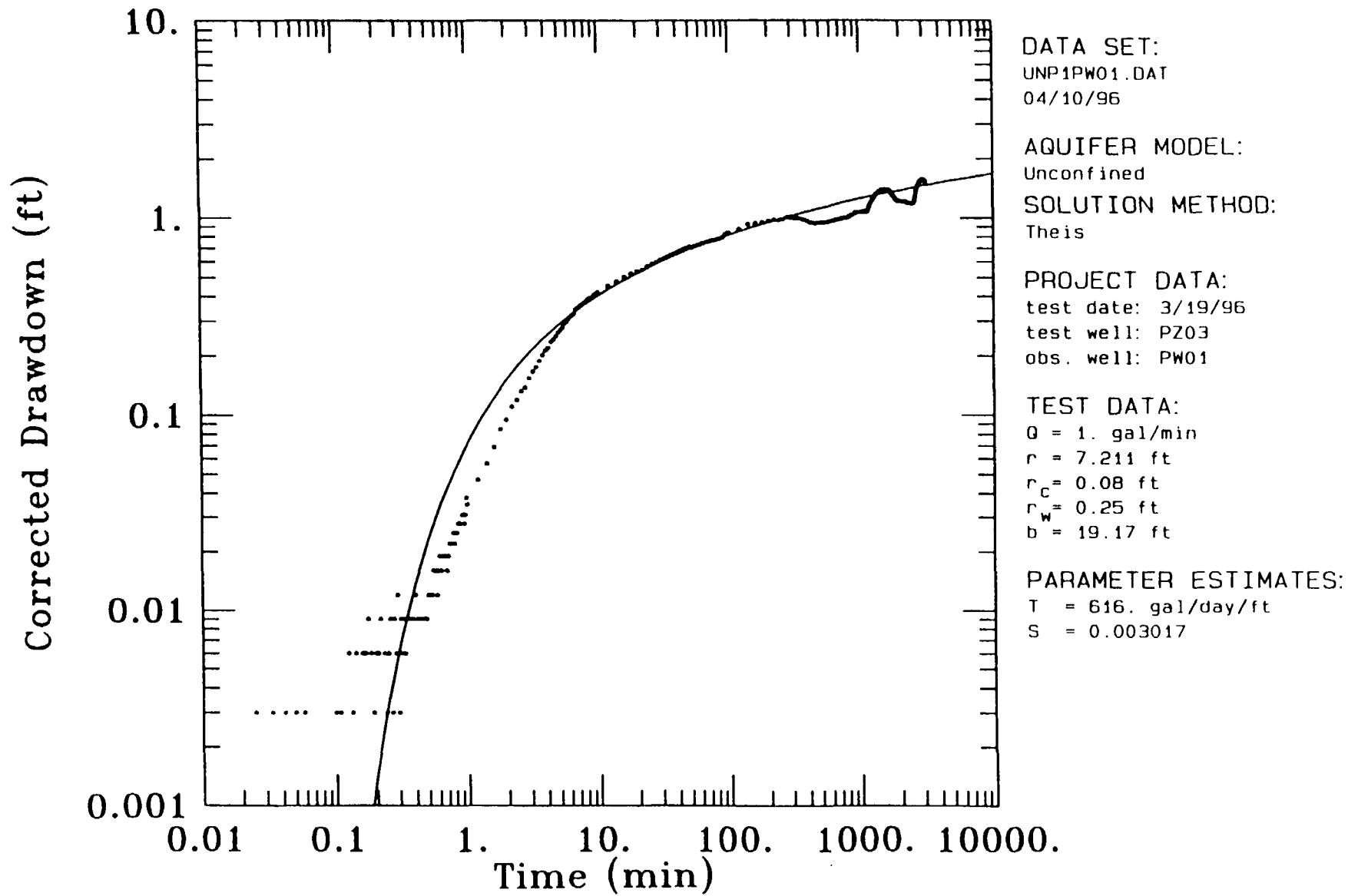
Aquifer: unconfined

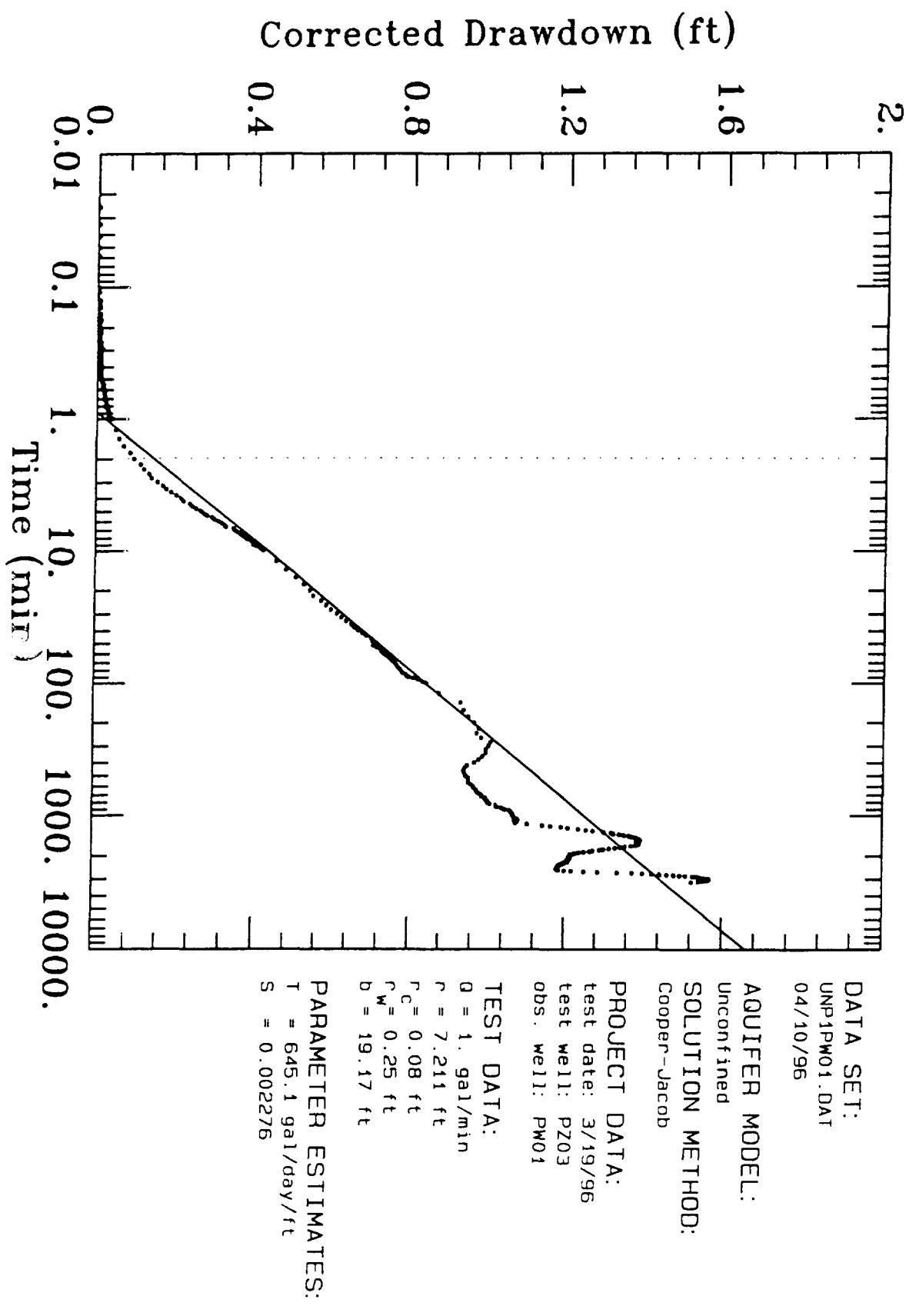


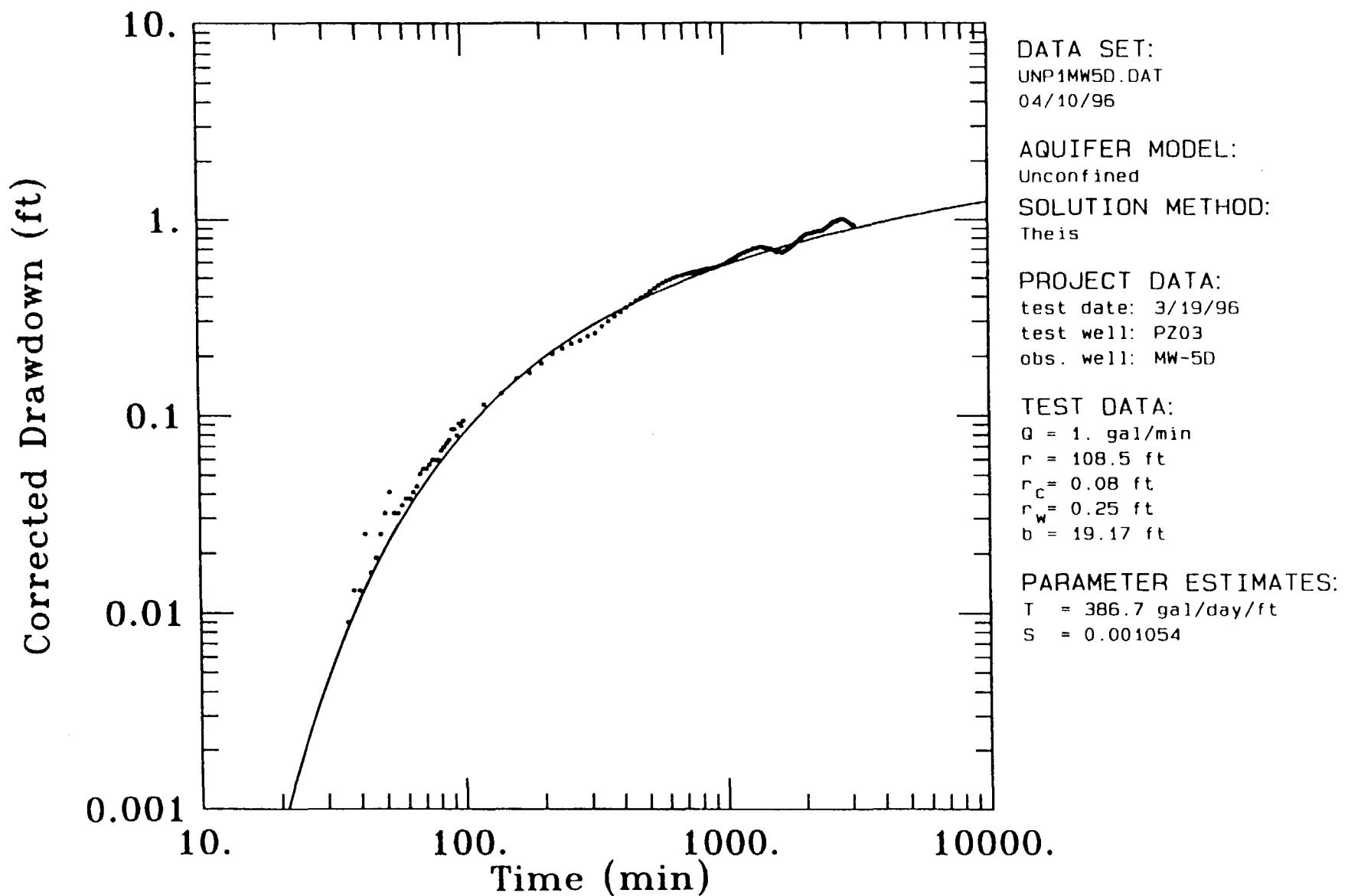


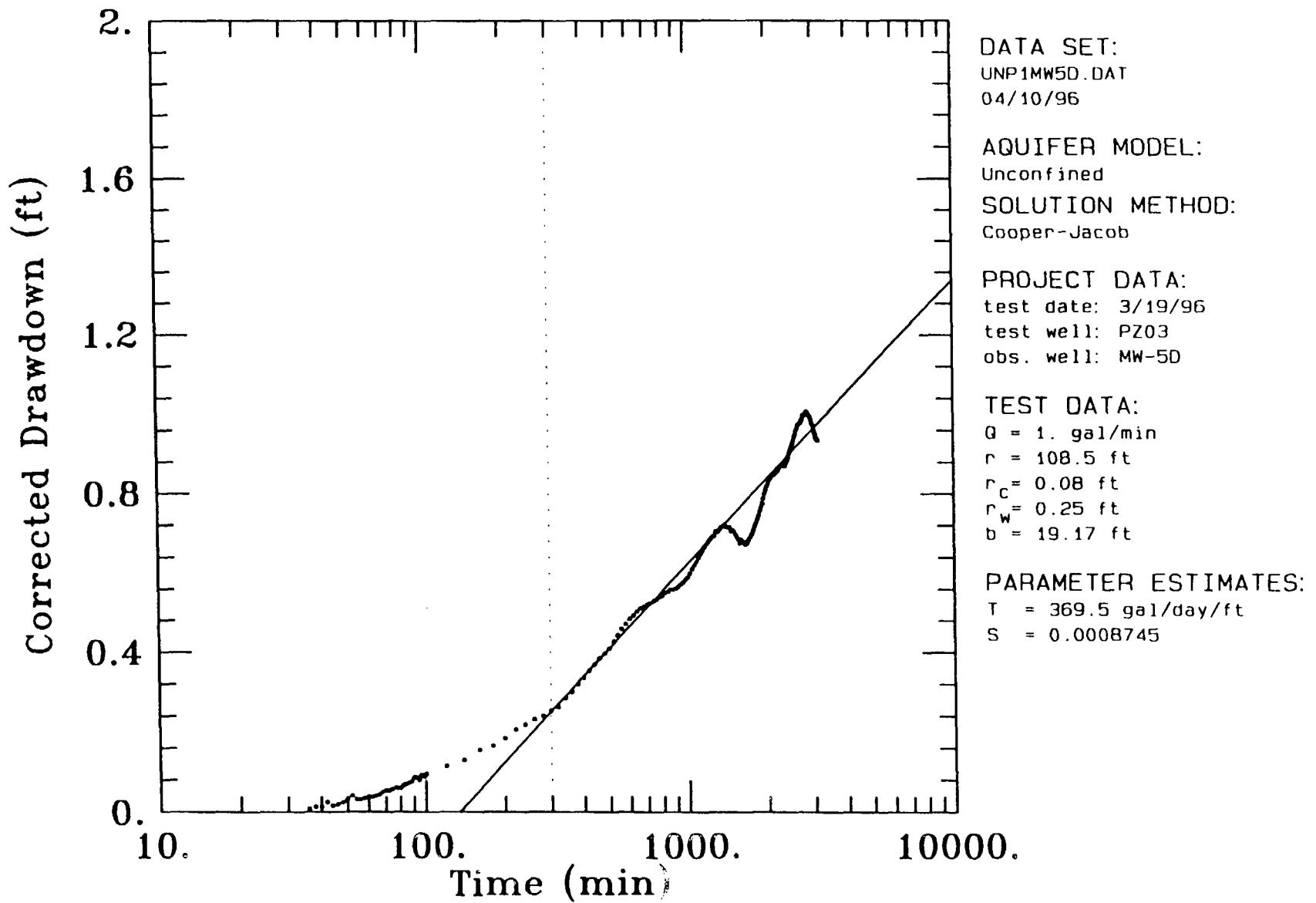


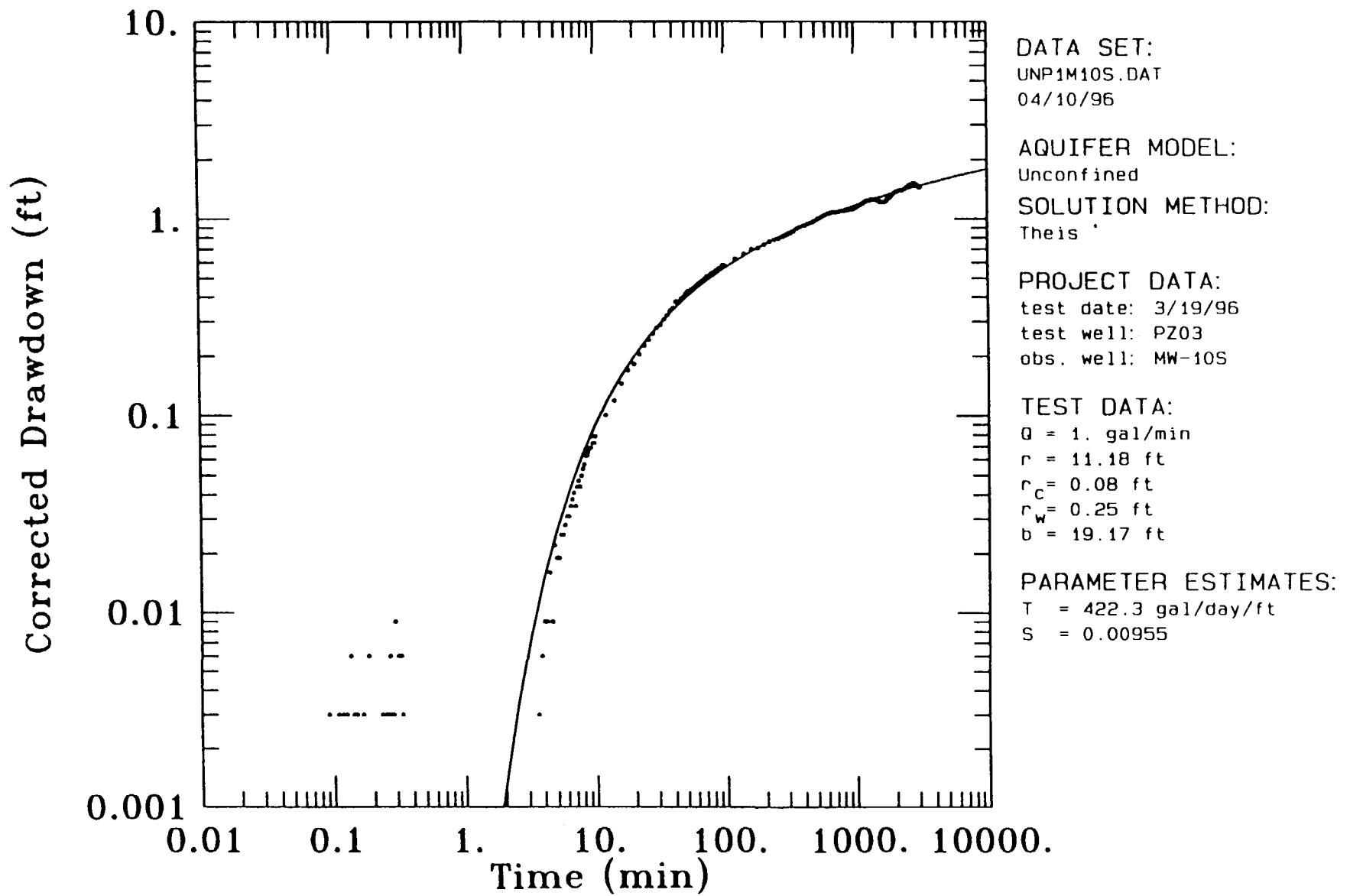


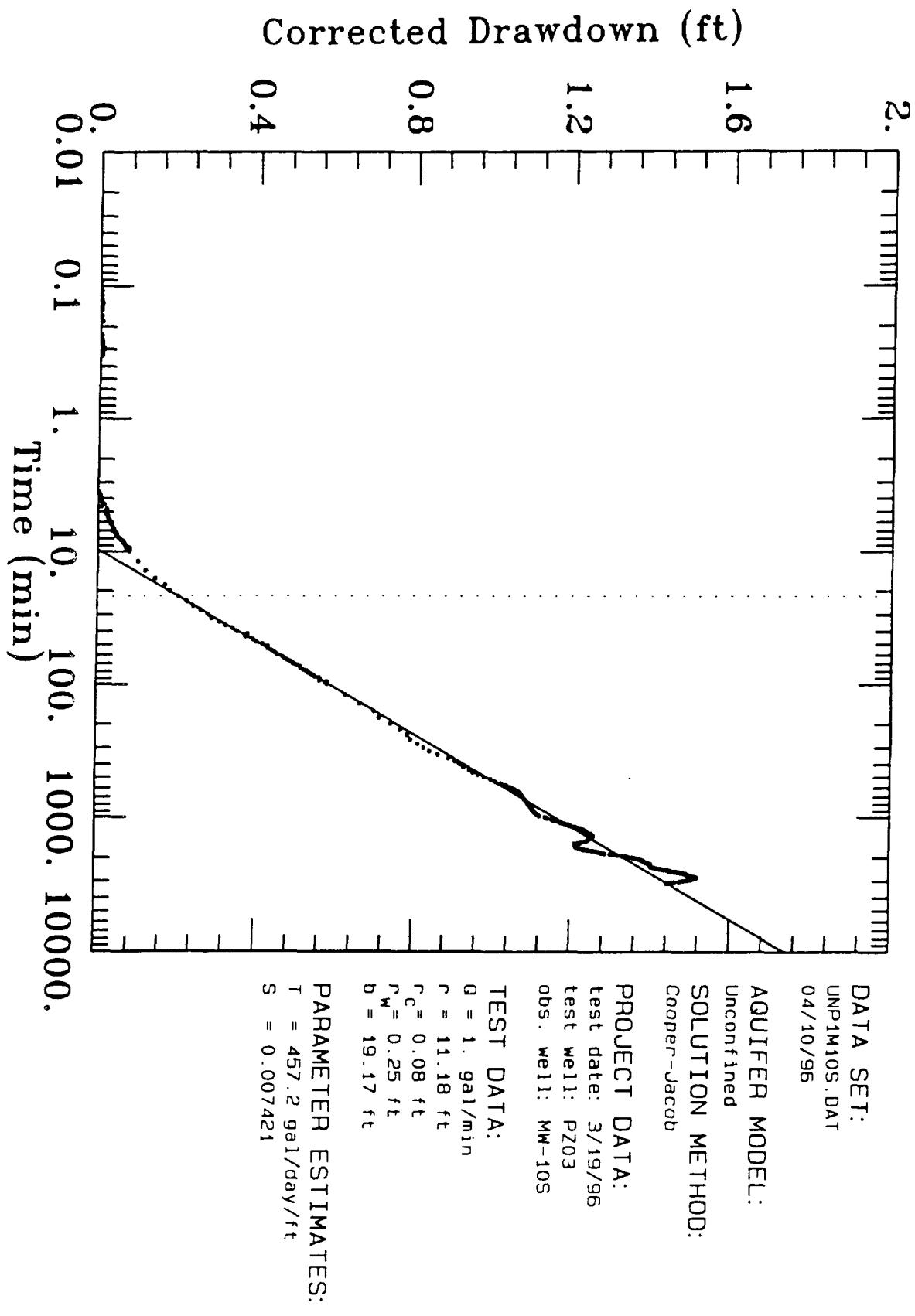


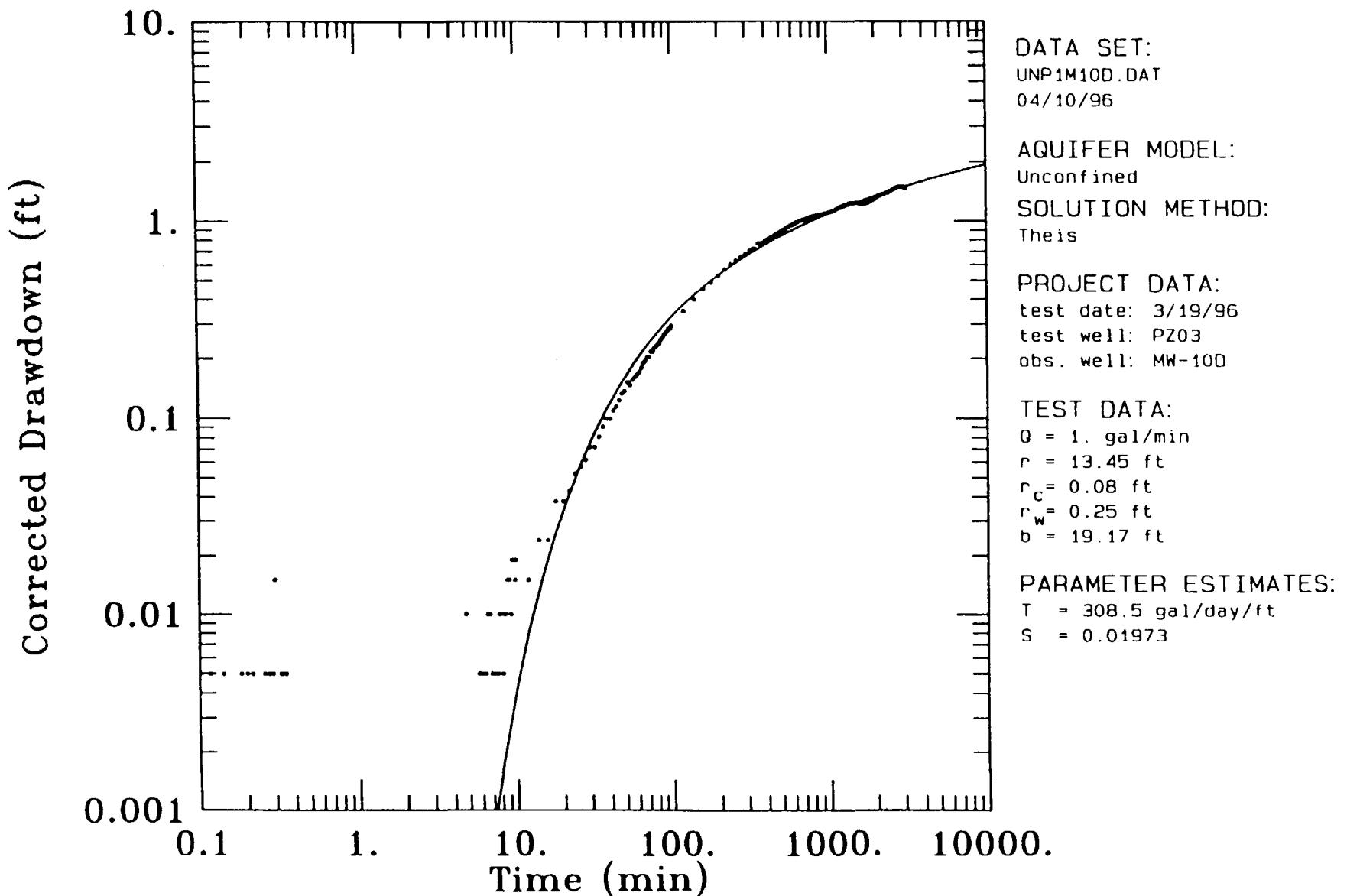


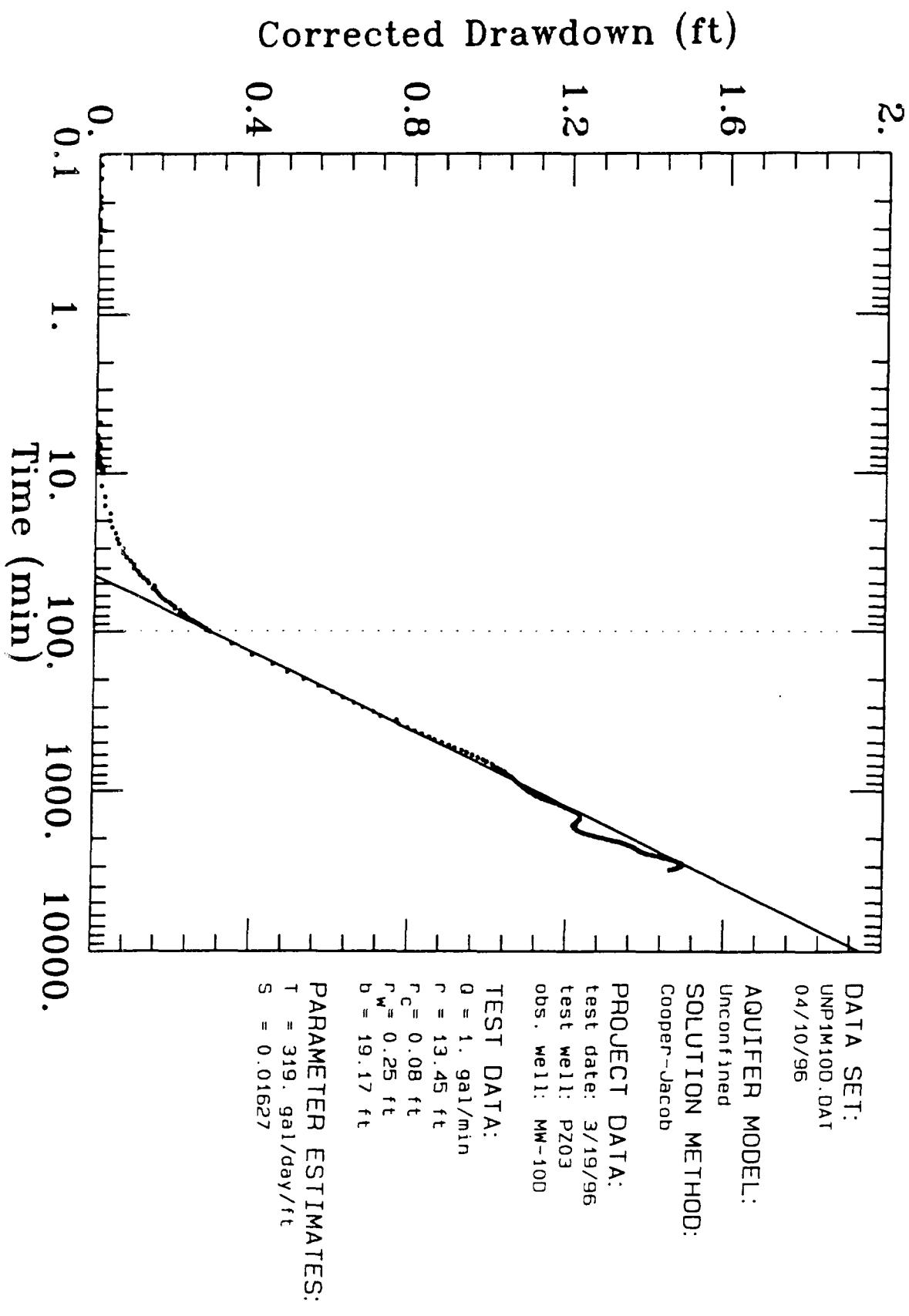


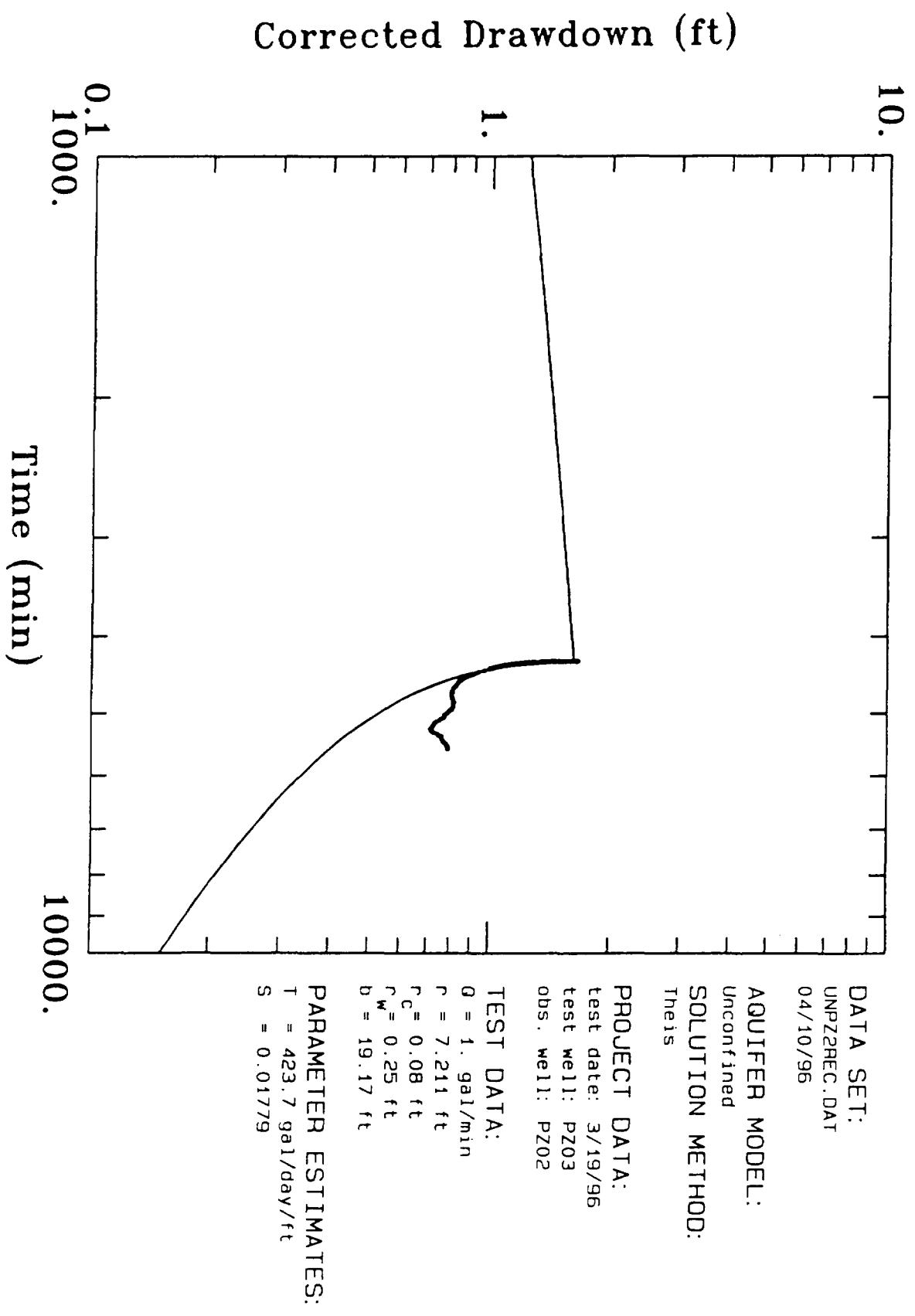


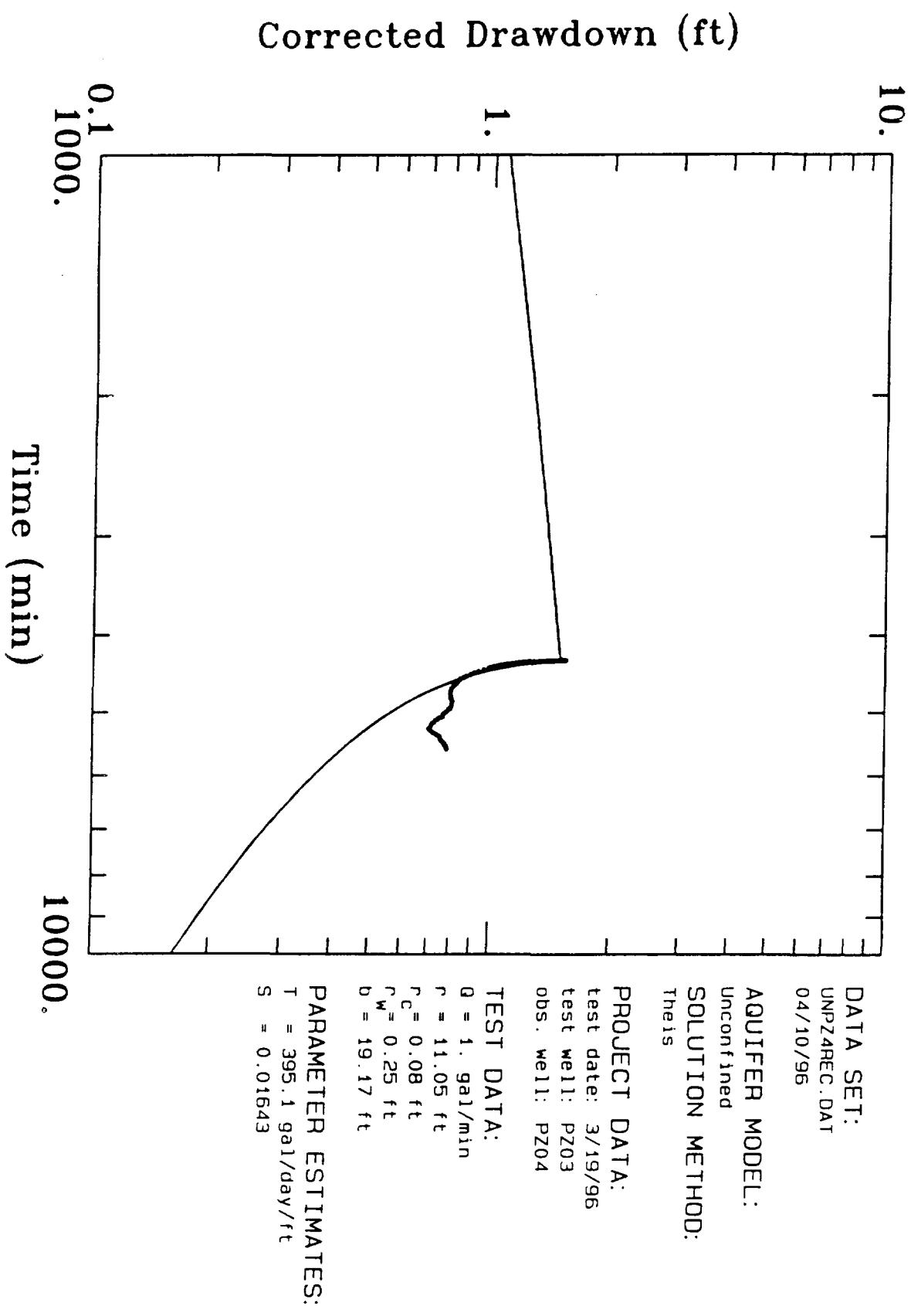


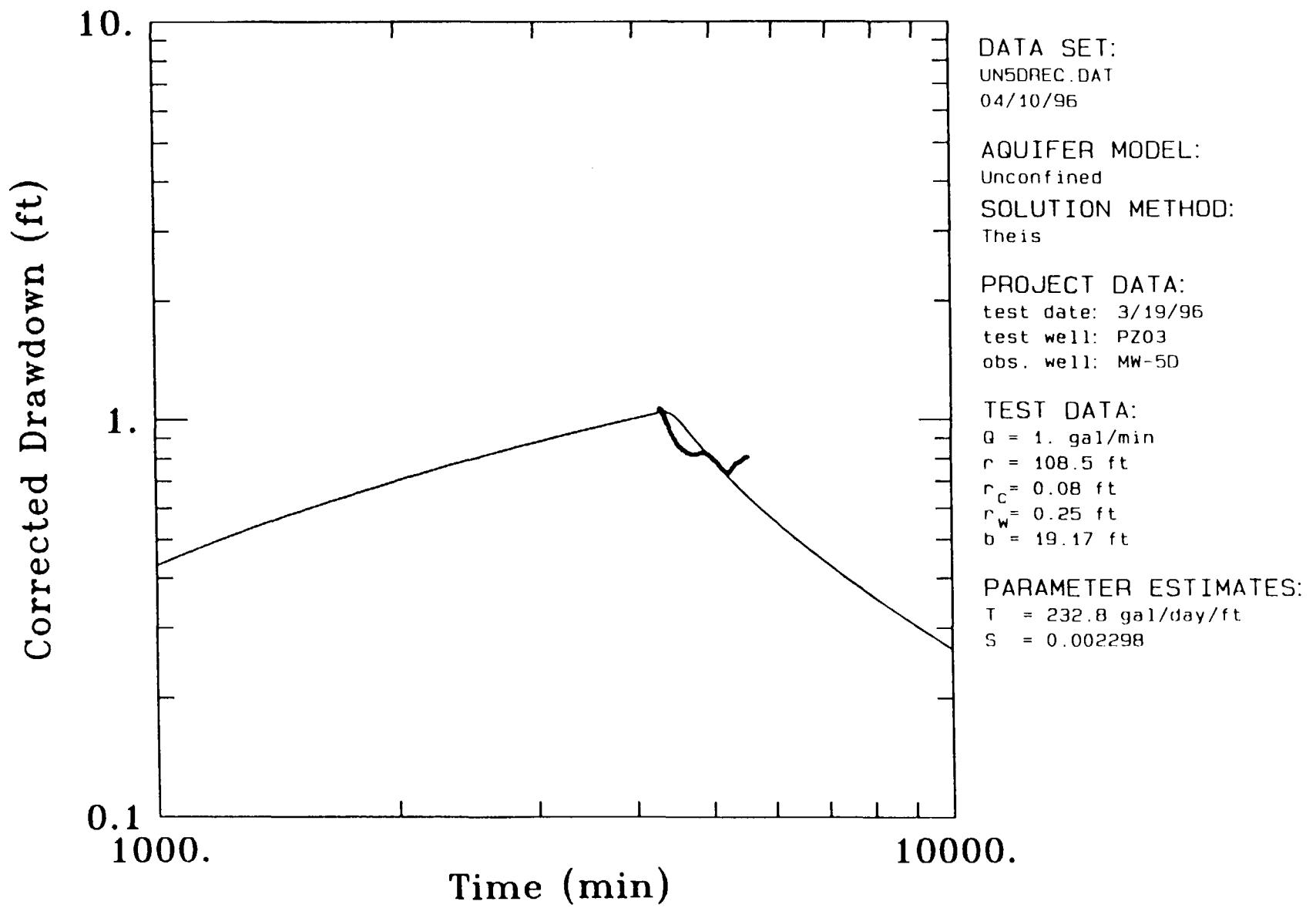


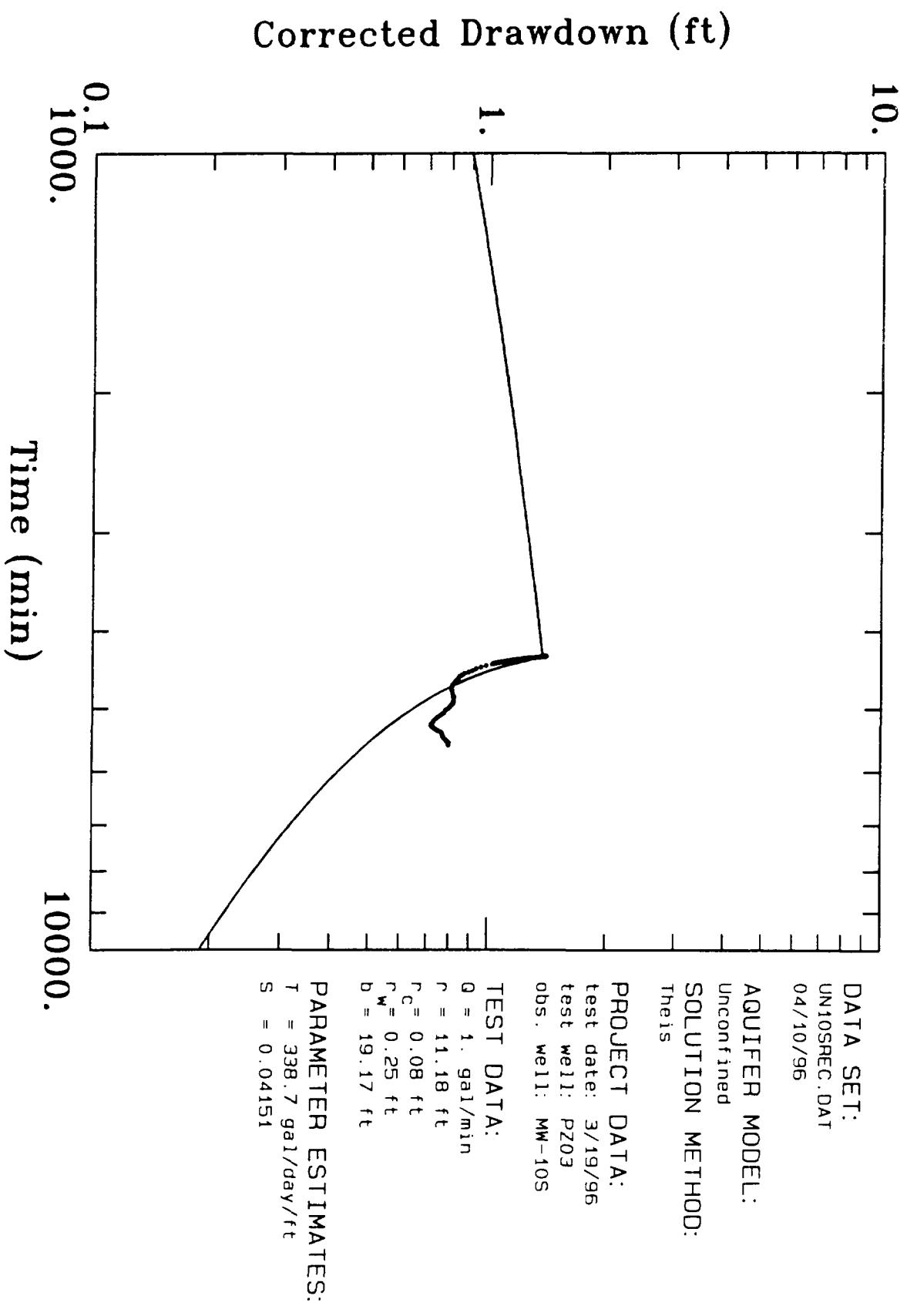


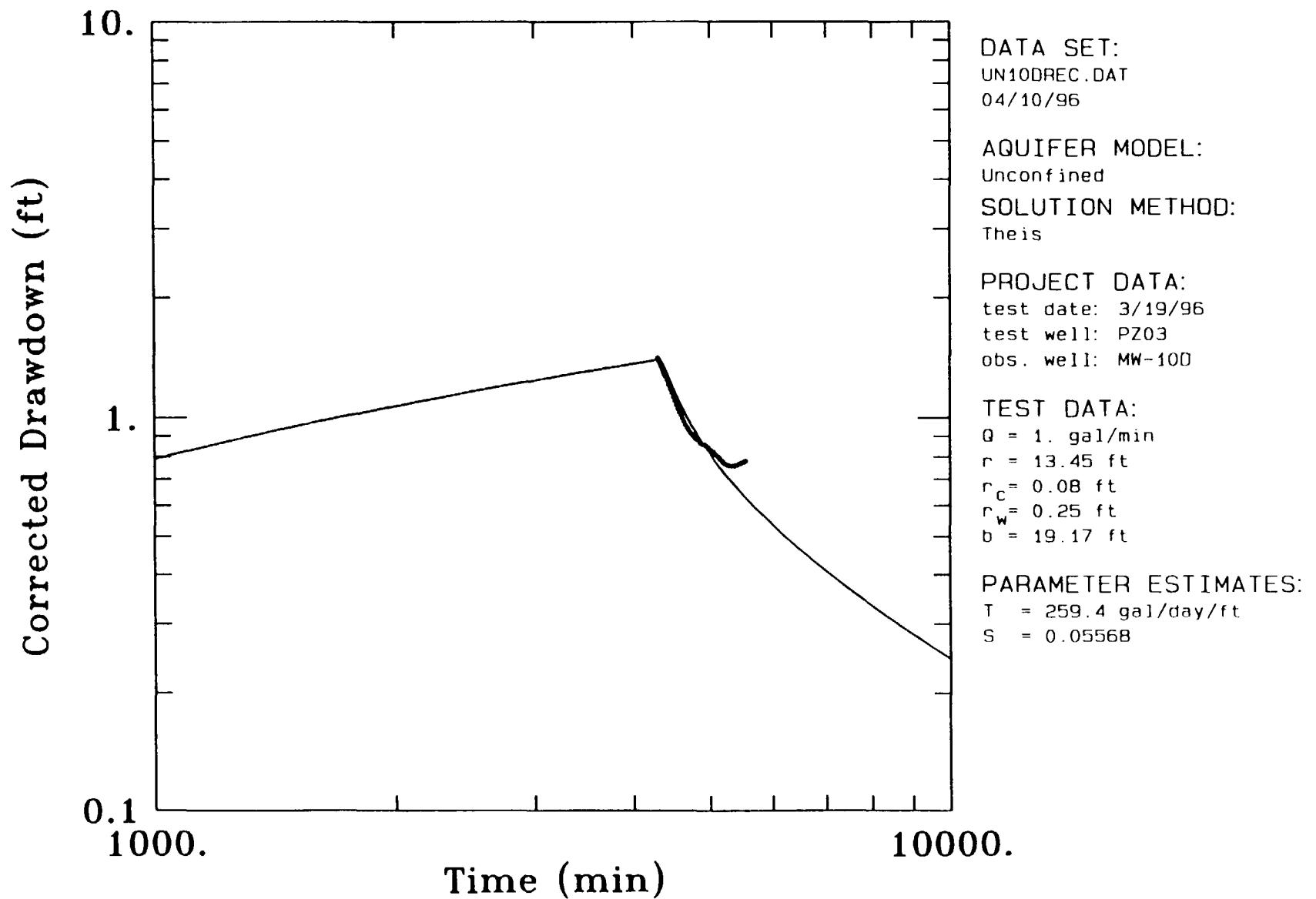




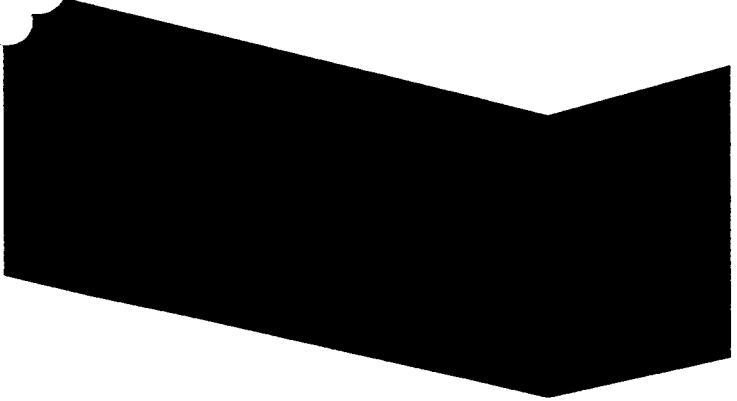








Water level data, as recorded by the onsite environmental logger,  
are on diskette in Appendix E.



## **Appendix G**

### **Aquifer Test Water Quality Results**

Analytical Data Summary, Volatiles in Aquifer Test Groundwater  
 Phase II Focused Field Investigation  
 Marzone Superfund Site  
 March, 1996

| Parameters/Units          | StationID       | PZ03     | PZ03     | PZ03     |
|---------------------------|-----------------|----------|----------|----------|
|                           | SampleID        | MGC001   | MGC003   | MGC005   |
|                           | Collection Date | 03/20/96 | 03/21/96 | 03/23/96 |
| BENZENE                   | MG/L            | U 5      | U 5      | U 5      |
| BROMODICHLOROMETHANE      | MG/L            | U 5      | U 5      | U 5      |
| BROMOFORM                 | MG/L            | U 5      | U 5      | U 5      |
| BROMOMETHANE              | MG/L            | U 5      | U 5      | U 5      |
| CARBON TETRACHLORIDE      | MG/L            | U 5      | U 5      | U 5      |
| CHLOROBENZENE             | MG/L            | U 5      | U 5      | U 5      |
| CHLOROETHANE              | MG/L            | U 5      | U 5      | U 5      |
| 2-CHLOROETHYL VINYL ETHER | MG/L            | U 2.5    | U 2.5    | U 2.5    |
| CHLOROFORM                | MG/L            | U 5      | U 5      | U 5      |
| CHLOROMETHANE             | MG/L            | U 5      | U 5      | U 5      |
| DIBROMOCHLOROMETHANE      | MG/L            | U 5      | U 5      | U 5      |
| 1,2-DICHLOROBENZENE       | MG/L            | U 5      | U 5      | U 5      |
| 1,3-DICHLOROBENZENE       | MG/L            | U 5      | U 5      | U 5      |
| 1,4-DICHLOROBENZENE       | MG/L            | U 5      | U 5      | U 5      |
| DICHLORODIFLUOROMETHANE   | MG/L            | U 5      | U 5      | U 5      |
| 1,1-DICHLOROETHANE        | MG/L            | U 5      | U 5      | U 5      |
| 1,2-DICHLOROETHANE        | MG/L            | U 5      | U 5      | U 5      |
| 1,1-DICHLOROETHENE        | MG/L            | U 5      | U 5      | U 5      |
| cis-1,2-DICHLOROETHENE    | MG/L            | U 5      | U 5      | U 5      |
| trans-1,2-DICHLOROETHENE  | MG/L            | U 5      | U 5      | U 5      |
| 1,2-DICHLOROPROPANE       | MG/L            | U 5      | U 5      | U 5      |
| cis-1,3-DICHLOROPROPENE   | MG/L            | U 5      | U 5      | U 5      |
| trans-1,3-DICHLOROPROPENE | MG/L            | U 5      | U 5      | U 5      |
| ETHYLBENZENE              | MG/L            | = 5.3    | = 11     | = 6.5    |
| tert-BUTYL METHYL ETHER   | MG/L            | U 5      | U 5      | U 5      |
| METHYLENE CHLORIDE        | MG/L            | U 2.5    | U 2.5    | U 2.5    |
| 1,1,2,2-TETRACHLOROETHANE | MG/L            | U 5      | U 5      | U 5      |
| TETRACHLOROETHYLENE(PCE)  | MG/L            | U 5      | U 5      | U 5      |
| TOLUENE                   | MG/L            | U 5      | = .52    | U 5      |
| 1,1,1-TRICHLOROETHANE     | MG/L            | U 5      | U 5      | U 5      |
| 1,1,2-TRICHLOROETHANE     | MG/L            | U 5      | U 5      | U 5      |
| TRICHLOROETHYLENE (TCE)   | MG/L            | U 5      | U 5      | U 5      |
| TRICHLOROFUOROMETHANE     | MG/L            | U 5      | U 5      | U 5      |
| VINYL CHLORIDE            | MG/L            | U 5      | U 5      | U 5      |
| XYLENES, TOTAL            | MG/L            | = 36     | = 76     | = 46     |

Notes:

U: Not detected

=: Detected

**Analytical Data Summary, Semivolatiles in Aquifer Test Groundwater**  
**Phase II Focused Field Investigation**  
**Marzone Superfund Site**  
**March, 1996**

| Parameters/Units                               | StationID       | PZ03     | PZ03     | PZ03     | PZ03     | PZ03     | PZ03     |
|--|-----------------|----------|----------|----------|----------|----------|----------|
|  | SampleID        | MGC001   | MGC001DL | MGC003   | MGC003DL | MGC005   | MGC005DL |
|  | Collection Date | 03/20/96 | 03/20/96 | 03/21/96 | 03/21/96 | 03/23/96 | 03/23/96 |
| N-NITROSODIMETHYLAMINE                         | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2-PICOLINE (ALPHA-PICOLINE)                    | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| METHYL METHANESULFONATE                        | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| ETHYL METHANESULFONATE                         | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| PHENOL   | MG/L            | J .088   | R 1.6    | J .078   | R 1.6    | J .098   | R 1.6    |
| ANILINE (PHENYLAMINE, AMINOBENZENE)            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER) | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2-CHLOROPHENOL                                 | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 1,3-DICHLOROBENZENE                            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 1,4-DICHLOROBENZENE                            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| BENZYL ALCOHOL                                 | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 1,2-DICHLOROBENZENE                            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2-METHYLPHENOL (o-CRESOL)                      | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2,2'-OXYBIS(1-CHLORO)PROPANE                   | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 3- and 4-METHYLPHENOL (CRESOLS, m & p)         | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| ACETOPHENONE                                   | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| N-NITROSODI-n-PROPYLAMINE                      | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| HEXACHLOROETHANE                               | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| NITROBENZENE                                   | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| N-NITROSOPIPERIDINE                            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| ISOPHORONE                                     | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2-NITROPHENOL                                  | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2,4-DIMETHYLPHENOL                             | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| BENZOIC ACID                                   | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| bis(2-CHLOROETHOXY) METHANE                    | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2,4-DICHLOROPHENOL                             | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | J .021   | R 1.6    |
| 1,2,4-TRICHLOROBENZENE                         | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| NAPHTHALENE                                    | MG/L            | J .081   | R 1.6    | J .1     | R 1.6    | J .098   | R 1.6    |
| 4-CHLOROANILINE                                | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2,6-DICHLOROPHENOL                             | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| HEXACHLOROBUTADIENE                            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| N-NITROSO-DI-N-BUTYLAMINE                      | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 4-CHLORO-3-METHYLPHENOL                        | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2-METHYLNAPHTHALENE                            | MG/L            | J .05    | R 1.6    | J .054   | R 1.6    | J .047   | R 1.6    |

**Analytical Data Summary, Semivolatiles in Aquifer Test Groundwater**  
**Phase II Focused Field Investigation**  
**Marzone Superfund Site**  
**March, 1996**

| Parameters/Units                     | StationID       | PZ03     | PZ03     | PZ03     | PZ03     | PZ03     | PZ03     |
|--------------------------------------|-----------------|----------|----------|----------|----------|----------|----------|
|                                      | SampleID        | MGC001   | MGC001DL | MGC003   | MGC003DL | MGC005   | MGC005DL |
|                                      | Collection Date | 03/20/96 | 03/20/96 | 03/21/96 | 03/21/96 | 03/23/96 | 03/23/96 |
| N-NITROSODIMETHYLAMINE               | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 1,2,4,5-TETRACHLOROBENZENE           | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| HEXACHLOROCYCLOPENTADIENE            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2,4,6-TRICHLOROPHENOL                | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2,4,5-TRICHLOROPHENOL                | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| 2-CHLORONAPHTHALENE                  | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 1-CHLORONAPHTHALENE                  | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2-NITROANILINE                       | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| DIMETHYL PHTHALATE                   | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2,6-DINITROTOLUENE                   | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| ACENAPHTHYLENE                       | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 3-NITROANILINE                       | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| ACENAPHTHENE                         | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 2,4-DINITROPHENOL                    | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| 4-NITROPHENOL                        | MG/L            | R 6.7    | = 8.5    | R 7.1    | = 6.8    | R 7.1    | = 7.8    |
| DIBENZOFURAN                         | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| PENTACHLOROBENZENE                   | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| 2,4-DINITROTOLUENE                   | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 1-NAPHTHYLAMINE                      | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| 2-NAPHTHYLAMINE (2-AMINONAPHTHALENE) | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| 2,3,4,6-TETRACHLOROPHENOL            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| DIETHYL PHTHALATE                    | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| FLUORENE                             | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 4-CHLOROPHENYL PHENYL ETHER          | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 4-NITROANILINE                       | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| 4,6-DINITRO-2-METHYLPHENOL           | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| N-NITROSODIPHENYLAMINE               | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 1,2-DIPHENYLHYDRAZINE                | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| PHENACETIN                           | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 4-BROMOPHENYL PHENYL ETHER           | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| HEXACHLOROBENZENE                    | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 4-AMINOBIPHENYL (4-BIPHENYLAMINE)    | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| PENTACHLOROPHENOL (Method 8270)      | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| PRONAMIDE                            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |

**Analytical Data Summary, Semivolatiles in Aquifer Test Groundwater**  
**Phase II Focused Field Investigation**  
**Marzone Superfund Site**  
**March, 1996**

| Parameters/Units                | StationID       | PZ03     | PZ03     | PZ03     | PZ03     | PZ03     | PZ03     |
|---------------------------------|-----------------|----------|----------|----------|----------|----------|----------|
|                                 | SampleID        | MGC001   | MGC001DL | MGC003   | MGC003DL | MGC005   | MGC005DL |
|                                 | Collection Date | 03/20/96 | 03/20/96 | 03/21/96 | 03/21/96 | 03/23/96 | 03/23/96 |
| N-NITROSODIMETHYLAMINE          | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| PENTACHLORONITROBENZENE         | MG/L            | U 1      | R 8      | U 1      | R 8      | U 1      | R 8      |
| PHENANTHRENE                    | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| ANTHRACENE                      | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| DI-n-BUTYL PHTHALATE            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| FLUORANTHENE                    | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| BENZIDINE                       | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| PYRENE                          | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| p-DIMETHYLAMINOAZOBENZENE       | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| BENZYL BUTYL PHTHALATE          | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| BENZO(a)ANTHRACENE              | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 3,3'-DICHLOROBENZIDINE          | MG/L            | U .4     | R 3.2    | U .4     | R 3.2    | U .4     | R 3.2    |
| CHRYSENE                        | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| bis(2-ETHYLHEXYL) PHTHALATE     | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| DI-n-OCTYLPHthalate             | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| BENZO(b)FLUORANTHENE            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 7,12-DIMETHYLBENZ(a)ANTHRACENE  | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| BENZO(k)FLUORANTHENE            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| BENZO(a)PYRENE                  | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| 3-METHYLCHOLANTHRENE            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| INDENO(1,2,3-c,d)PYRENE         | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| DIBENZ(a,h)ANTHRACENE           | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| BENZO(g,h,i)PERYLENE            | MG/L            | U .2     | R 1.6    | U .2     | R 1.6    | U .2     | R 1.6    |
| PENTACHLOROPHENOL (Method 8040) | MG/L            | U .005   |          | U .005   |          | U .005   |          |

Notes:

RE: Reanalysis

U: Not detected

=: Detected

J: Estimated - detected below reporting limit.

R: Rejected

## Analytical Data Summary, Pesticides/PCBs in Aquifer Test Groundwater

## Phase II Focused Field Investigation

## Marzone Superfund Site

March, 1996

| Parameters/Units    | StationID       | PZ03     | PZ03     | PZ03     |
|---------------------|-----------------|----------|----------|----------|
|                     | SampleID        | MGC001   | MGC003   | MGC005   |
|                     | Collection Date | 03/20/96 | 03/21/96 | 03/23/96 |
| ALPHA BHC           | MG/L            | = .0058  | = .0053  | = .0056  |
| BETA BHC            | MG/L            | = .0016  | J .0015  | = .0016  |
| DELTA BHC           | MG/L            | = .0063  | = .0055  | = .0065  |
| GAMMA BHC (LINDANE) | MG/L            | = .016   | = .014   | = .018   |
| HEPTACHLOR          | MG/L            | U .0008  | U .0008  | U .0008  |
| 4,4'-DDE            | MG/L            | U .0008  | U .0008  | U .0008  |
| 4,4'-DDD            | MG/L            | J .0014  | U .0016  | U .0016  |
| 4,4'-DDT            | MG/L            | J .0014  | U .0016  | U .0016  |
| CHLORDANE           | MG/L            | U .008   | U .008   | U .008   |
| TOXAPHENE           | MG/L            | U .04    | U .04    | U .04    |
| ATRAZINE            | MG/L            | = .08    | = .093   | = .081   |
| PARATHION, METHYL   | MG/L            | = .038   | = .045   | = .046   |
| PARATHION, ETHYL    | MG/L            | U .02    | U .02    | U .02    |
| AROCLOR 1016        | MG/L            | U .04    | U .04    | U .04    |
| AROCLOR 1221        | MG/L            | U .08    | U .08    | U .08    |
| AROCLOR 1232        | MG/L            | U .08    | U .08    | U .08    |
| AROCLOR 1242        | MG/L            | U .04    | U .04    | U .04    |
| AROCLOR 1248        | MG/L            | U .04    | U .04    | U .04    |
| AROCLOR 1254        | MG/L            | U .02    | U .02    | U .02    |
| AROCLOR 1260        | MG/L            | U .02    | U .02    | U .02    |

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Notes:

U: Not detected

=: Detected

J: Estimated - detected below reporting limit.

**Analytical Data Summary, PAHs in Aquifer Test Groundwater**  
**Phase II Focused Field Investigation**  
**Marzone Superfund Site**  
**March, 1996**

| <b>Parameters/Units</b> | <b>StationID</b>       | PZ03     | PZ03     | PZ03     | PZ03     | PZ03     |
|-------------------------|------------------------|----------|----------|----------|----------|----------|
|                         | <b>SampleID</b>        | MGC001   | MGC001DL | MGC003   | MGC005   | MGC005DL |
|                         | <b>Collection Date</b> | 03/20/96 | 03/20/96 | 03/21/96 | 03/23/96 | 03/23/96 |
| NAPHTHALENE             | MG/L                   | R .21    | = .21    | = .19    | R .22    | = .23    |
| ACENAPHTHYLENE          | MG/L                   | = .027   | R .026   | = .026   | = .027   | R .028   |
| ACENAPHTHENE            | MG/L                   | U .002   | R .004   | U .002   | U .002   | R .004   |
| FLUORENE                | MG/L                   | U .001   | R .002   | U .001   | U .001   | R .002   |
| PHENANTHRENE            | MG/L                   | U .001   | R .002   | U .001   | U .001   | R .002   |
| ANTHRACENE              | MG/L                   | U .0002  | R .0004  | U .0002  | U .0002  | R .0004  |
| FLUORANTHENE            | MG/L                   | U .0002  | R .0004  | U .0002  | U .0002  | R .0004  |
| PYRENE                  | MG/L                   | U .002   | R .004   | U .002   | U .002   | R .004   |
| BENZO(a)ANTHRACENE      | MG/L                   | U .0002  | R .0004  | U .0002  | U .0002  | R .0004  |
| CHRYSENE                | MG/L                   | U .002   | R .004   | U .002   | U .002   | R .004   |
| BENZO(b)FLUORANTHENE    | MG/L                   | U .0001  | R .0002  | U .0001  | U .0001  | R .0002  |
| BENZO(k)FLUORANTHENE    | MG/L                   | U .0001  | R .0002  | U .0001  | U .0001  | R .0002  |
| BENZO(a)PYRENE          | MG/L                   | U .0001  | R .0002  | U .0001  | U .0001  | R .0002  |
| DIBENZ(a,h)ANTHRACENE   | MG/L                   | U .0002  | R .0004  | U .0002  | U .0002  | R .0004  |
| INDENO(1,2,3-c,d)PYRENE | MG/L                   | U .0002  | R .0004  | U .0002  | U .0002  | R .0004  |
| BENZO(g,h,i)PERYLENE    | MG/L                   | U .0002  | R .0004  | U .0002  | U .0002  | R .0004  |

Notes:

DL: Dilution

U: Not detected

=: Detected

R: Rejected

Analytical Data Summary, General Chemistry Parameters in Aquifer Test Groundwater  
 Phase II Focused Field Investigation  
 Marzone Superfund Site  
 March, 1996

| Parameters/Units       | StationID       | PZ03     | PZ03     | PZ03     |
|------------------------|-----------------|----------|----------|----------|
|                        | SampleID        | MGC001   | MGC003   | MGC005   |
|                        | Collection Date | 03/20/96 | 03/21/96 | 03/23/96 |
| pH                     | PH UNITS        | J 4.7    | J 4.7    | J 4.7    |
| TOTAL DISSOLVED SOLIDS | MG/L            | = 1030   | = 1010   | = 994    |
| SUSPENDED SOLIDS       | MG/L            | < 4      | < 4      | < 4      |
| COD                    | MG/L            | = 375    | = 382    | = 389    |
| TOTAL ORGANIC CARBON   | MG/L            | = 30     | = 28.8   | = 40.6   |

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Notes:

=: Detected

J: Estimated - detected below reporting limit.

<: Less than value shown

**Analytical Data Summary, Metals in Aquifer Test Groundwater  
Phase II Focused Field Investigation  
Marzone Superfund Site  
March, 1996**

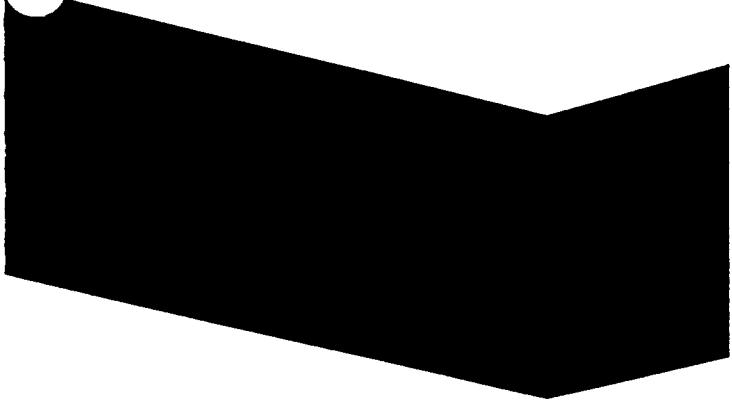
| Parameters/Units | StationID       | PZ03     | PZ03     | PZ03     |
|------------------|-----------------|----------|----------|----------|
|                  | SampleID        | MGC001   | MGC003   | MGC005   |
|                  | Collection Date | 03/20/96 | 03/21/96 | 03/23/96 |
| IRON             | MG/L            | = 30.7   | = 31.2   | = 31.8   |
| MANGANESE        | MG/L            | = 46.4   | = 47     | = 49.5   |

Notes:

=: Detected

**PZ03 - Aquifer Test Field Water Quality Data**

| Date    | Time | pH (SU) | Conductivity ( $\mu\text{mhos/cm}$ ) | Temperature (°C) | Turbidity (NTU) |
|---------|------|---------|--------------------------------------|------------------|-----------------|
| 3/15/96 | 1555 | 4.7     | 1,675                                | 22.8             | 3               |
| 3/15/96 | 1615 | 4.7     | 1,700                                | 22.5             | 18              |
| 3/16/96 | 1240 | 4.9     | 1,500                                | 25.0             |                 |
| 3/16/96 | 1243 | 4.6     | 1,800                                | 25.0             | 10              |
| 3/16/96 | 1246 | 4.5     | 1,800                                | 25.0             | 10              |
| 3/16/96 | 1310 | 5.4     | 1,600                                | 25.0             | 12              |
| 3/16/96 | 1314 | 4.8     | 1,800                                | 25.0             | 8               |
| 3/16/96 | 1318 | 4.8     | 1,850                                | 25.0             | 8               |
| 3/20/96 | 1235 | 4.86    | 1,400                                | 16.6             | 33              |
| 3/21/96 | 1230 | 4.9     | 1,875                                | 20.3             | 2.3             |
| 3/23/96 | 1205 | 4.9     | 1,900                                | 20.2             | 1.8             |



## **Appendix H**

### **In Situ Hydraulic Conductivity (Slug) Test Results**

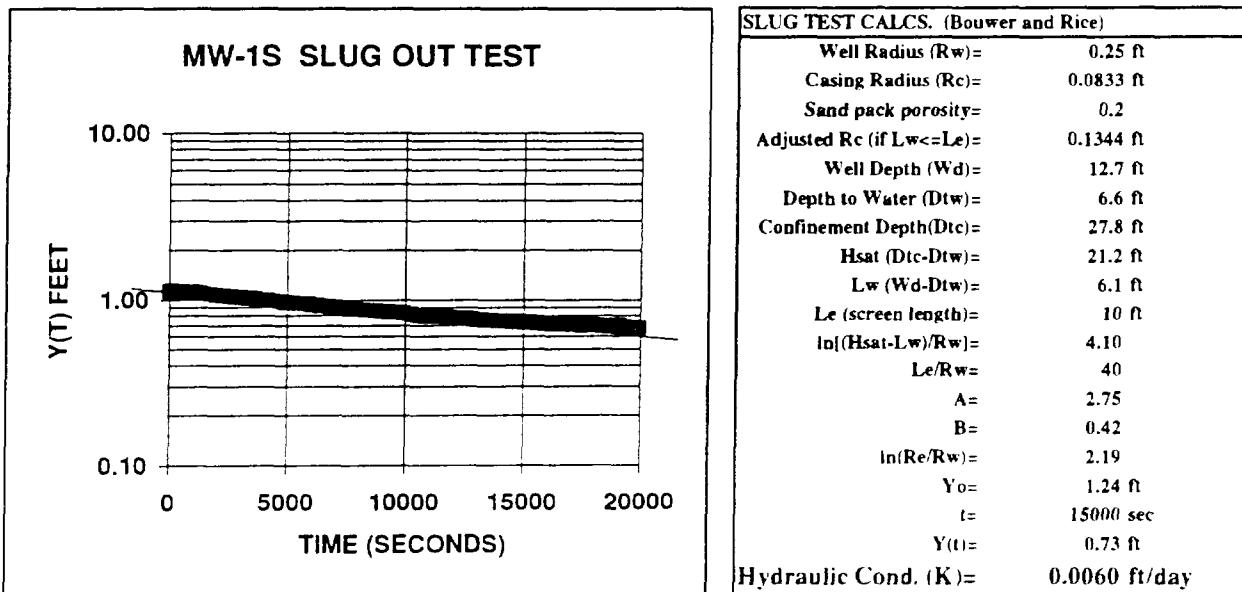
**Marzone Superfund Site**  
**Slug Test Results**  
**March 11 - 15, 1996**

| Well   | Depth | K (ft/d) |
|--------|-------|----------|
| MW-1S  | 12.7  | 0.006    |
| MW-1D  | 27.8  | 0.46     |
| MW-3S  | 13    | 0.152    |
| MW-3D  | 27.6  | 1.30     |
| MW-4S  | 12    | 0.11     |
| MW-5S  | 12    | 0.60     |
| MW-6S  | 12.8  | 0.64     |
| MW-6D  | 27.7  | 0.0017   |
| MW-7S  | 15.3  | 0.55     |
| MW-9S  | 12.6  | 2.9      |
| MW-11S | 17.7  | 0.049    |
| MW-11D | 27    | 0.11     |
| PZ01D  | 22.8  | 4.60     |



| CH2M HILL SLUG TEST DATA |  |  |  |  |  |  |  |
|--------------------------|--|--|--|--|--|--|--|
| PROJECT NO:              | 117612.G2.F2                                 |  |  |  |  |  |  |
| CLIENT:                  | MARZONE SUPERFUND SITE - Tifton, Georgia     |  |  |  |  |  |  |
| TEST DATE:               | 03/13/96                                     |  |  |  |  |  |  |
| WELL NO.:                | MW-1S  |  |  |  |  |  |  |
| COMPILED BY:             | MIKE WEATHERBY/GNV                           |  |  |  |  |  |  |
| TEST METHOD:             | SLUG OUT                                     |  |  |  |  |  |  |
| ANALYSIS METHOD:         | BOUWER and RICE - Partially Penetrating Well |  |  |  |  |  |  |

| ELAPSED TIME<br>(sec) | TRANSDUCER READING<br>(ft) | Y(t)<br>(ft) | ELAPSED TIME<br>(sec) | TRANSDUCER READING<br>(ft) | Y(t)<br>(ft) | ELAPSED TIME<br>(sec) | TRANSDUCER READING<br>(ft) | Y(t)<br>(ft) |
|-----------------------|----------------------------|--------------|-----------------------|----------------------------|--------------|-----------------------|----------------------------|--------------|
| 0                     | 1.24                       | 1.24         | 467                   | 1.14                       | 1.14         | 9839                  | 0.84                       | 0.84         |
| 5                     | 1.14                       | 1.14         | 503                   | 1.14                       | 1.14         | 10319                 | 0.82                       | 0.82         |
| 10                    | 1.14                       | 1.14         | 539                   | 1.13                       | 1.13         | 10799                 | 0.80                       | 0.80         |
| 15                    | 1.13                       | 1.13         | 575                   | 1.13                       | 1.13         | 11159                 | 0.80                       | 0.80         |
| 20                    | 1.13                       | 1.13         | 599                   | 1.13                       | 1.13         | 11639                 | 0.80                       | 0.80         |
| 25                    | 1.13                       | 1.13         | 959                   | 1.13                       | 1.13         | 12119                 | 0.78                       | 0.78         |
| 30                    | 1.13                       | 1.13         | 1319                  | 1.11                       | 1.11         | 12599                 | 0.78                       | 0.78         |
| 35                    | 1.13                       | 1.13         | 1679                  | 1.09                       | 1.09         | 13199                 | 0.76                       | 0.76         |
| 40                    | 1.13                       | 1.13         | 2039                  | 1.08                       | 1.08         | 13679                 | 0.75                       | 0.75         |
| 45                    | 1.13                       | 1.13         | 2399                  | 1.06                       | 1.06         | 14039                 | 0.75                       | 0.75         |
| 50                    | 1.13                       | 1.13         | 2639                  | 1.05                       | 1.05         | 14399                 | 0.75                       | 0.75         |
| 71                    | 1.13                       | 1.13         | 2999                  | 1.05                       | 1.05         | 14759                 | 0.74                       | 0.74         |
| 107                   | 1.14                       | 1.14         | 3239                  | 1.04                       | 1.04         | 15119                 | 0.74                       | 0.74         |
| 143                   | 1.15                       | 1.15         | 3479                  | 1.04                       | 1.04         | 15479                 | 0.73                       | 0.73         |
| 167                   | 1.15                       | 1.15         | 3839                  | 1.01                       | 1.01         | 15959                 | 0.72                       | 0.72         |
| 203                   | 1.14                       | 1.14         | 4199                  | 1.00                       | 1.00         | 16319                 | 0.72                       | 0.72         |
| 227                   | 1.14                       | 1.14         | 4559                  | 0.99                       | 0.99         | 16679                 | 0.71                       | 0.71         |
| 251                   | 1.13                       | 1.13         | 4919                  | 0.97                       | 0.97         | 17159                 | 0.72                       | 0.72         |
| 275                   | 1.13                       | 1.13         | 5279                  | 0.96                       | 0.96         | 17519                 | 0.70                       | 0.70         |
| 299                   | 1.13                       | 1.13         | 5639                  | 0.96                       | 0.96         | 17999                 | 0.71                       | 0.71         |
| 323                   | 1.13                       | 1.13         | 5999                  | 0.94                       | 0.94         | 18479                 | 0.69                       | 0.69         |
| 347                   | 1.13                       | 1.13         | 6479                  | 0.93                       | 0.93         | 18959                 | 0.70                       | 0.70         |
| 371                   | 1.13                       | 1.13         | 6839                  | 0.91                       | 0.91         | 19319                 | 0.69                       | 0.69         |
| 395                   | 1.13                       | 1.13         | 7199                  | 0.91                       | 0.91         | 19559                 | 0.68                       | 0.68         |
| 419                   | 1.13                       | 1.13         | 7559                  | 0.89                       | 0.89         | 19799                 | 0.68                       | 0.68         |
| 443                   | 1.14                       | 1.14         | 9239                  | 0.85                       | 0.85         | 19919                 | 0.68                       | 0.68         |

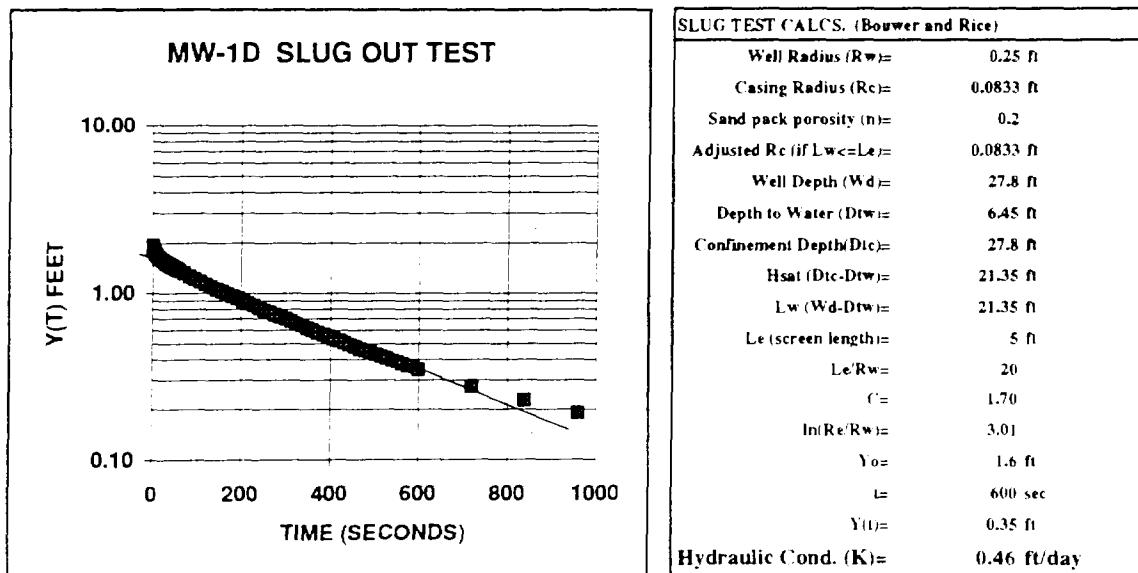


| SLUG TEST CALCS. (Bouwer and Rice)   |           |
|--------------------------------------|-----------|
| Well Radius ( $R_w$ )=               | 0.25 ft   |
| Casing Radius ( $R_c$ )=             | 0.0833 ft |
| Sand pack porosity=                  | 0.2       |
| Adjusted $R_c$ (if $L_w \leq L_e$ )= | 0.1344 ft |
| Well Depth ( $W_d$ )=                | 12.7 ft   |
| Depth to Water ( $D_{tw}$ )=         | 6.6 ft    |
| Confinement Depth ( $D_{tc}$ )=      | 27.8 ft   |
| $H_{sat}$ ( $D_{tc} - D_{tw}$ )=     | 21.2 ft   |
| $L_w$ ( $W_d - D_{tw}$ )=            | 6.1 ft    |
| $L_e$ (screen length)=               | 10 ft     |
| $ L_e  (H_{sat} - L_w) / R_w   =$    | 4.10      |
| $L_e / R_w =$                        | 40        |
| A=                                   | 2.75      |
| B=                                   | 0.42      |
| $\ln(R_c / R_w) =$                   | 2.19      |
| $Y_o =$                              | 1.24 ft   |
| t=                                   | 15000 sec |
| Y(t)=                                | 0.73 ft   |



| CH2M HILL SLUG TEST DATA |  |  |  |  |  |  |  |  |
|--------------------------|--|--|--|--|--|--|--|--|
| PROJECT NO:              | 117612.G2.F2                             |  |  |  |  |  |  |  |
| CLIENT:                  | MARZONE SUPERFUND SITE - Tifton, Georgia |  |  |  |  |  |  |  |
| TEST DATE:               | 03/13/96                                 |  |  |  |  |  |  |  |
| WELL NO.:                | MW-1D                                    |  |  |  |  |  |  |  |
| COMPILED BY:             | MIKE WEATHERBY/GNV                       |  |  |  |  |  |  |  |
| TEST METHOD:             | SLUG OUT                                 |  |  |  |  |  |  |  |
| ANALYSIS METHOD:         | BOUWER and RICE - Fully Penetrating Well |  |  |  |  |  |  |  |

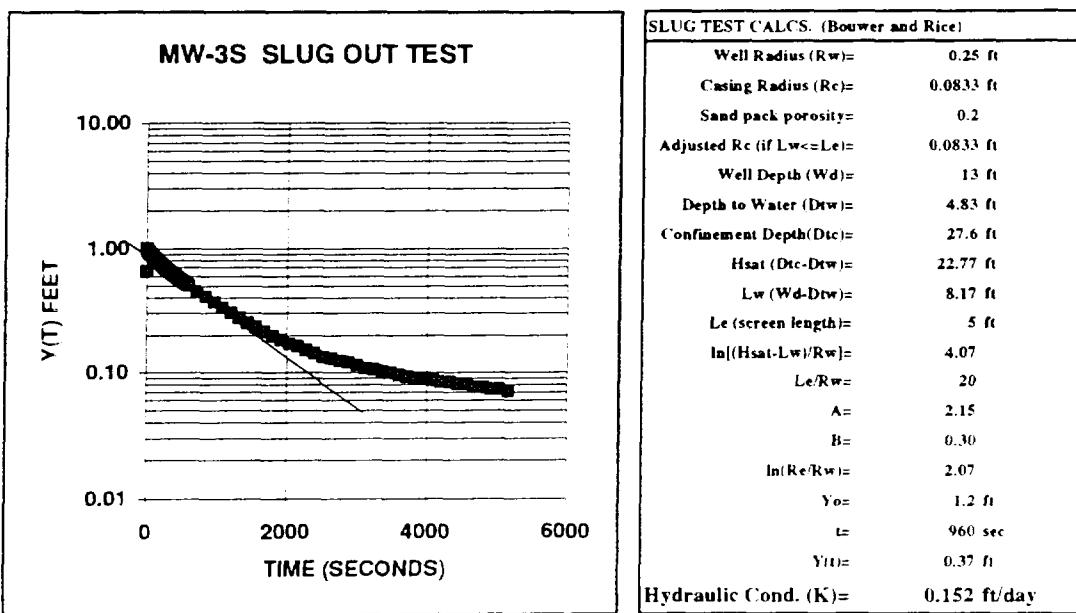
| ELAPSED TIME<br>(sec) | TRANSDUCER READING<br>(ft) | Y(0)<br>(ft) | ELAPSED TIME<br>(sec) | TRANSDUCER READING<br>(ft) | Y(t)<br>(ft) | ELAPSED TIME<br>(sec) | TRANSDUCER READING<br>(ft) | Y(t)<br>(ft) |
|-----------------------|----------------------------|--------------|-----------------------|----------------------------|--------------|-----------------------|----------------------------|--------------|
| 0                     | 2.67                       | 2.67         | 26                    | 1.55                       | 1.55         | 52                    | 1.41                       | 1.41         |
| 1                     | 1.93                       | 1.93         | 27                    | 1.54                       | 1.54         | 53                    | 1.40                       | 1.40         |
| 2                     | 1.87                       | 1.87         | 28                    | 1.53                       | 1.53         | 54                    | 1.40                       | 1.40         |
| 3                     | 1.83                       | 1.83         | 29                    | 1.53                       | 1.53         | 55                    | 1.39                       | 1.39         |
| 4                     | 1.80                       | 1.80         | 30                    | 1.53                       | 1.53         | 56                    | 1.39                       | 1.39         |
| 5                     | 1.77                       | 1.77         | 31                    | 1.52                       | 1.52         | 57                    | 1.38                       | 1.38         |
| 6                     | 1.75                       | 1.75         | 32                    | 1.51                       | 1.51         | 58                    | 1.38                       | 1.38         |
| 7                     | 1.73                       | 1.73         | 33                    | 1.51                       | 1.51         | 59                    | 1.37                       | 1.37         |
| 8                     | 1.72                       | 1.72         | 34                    | 1.50                       | 1.50         | 60                    | 1.37                       | 1.37         |
| 9                     | 1.71                       | 1.71         | 35                    | 1.49                       | 1.49         | 72                    | 1.32                       | 1.32         |
| 10                    | 1.69                       | 1.69         | 36                    | 1.49                       | 1.49         | 84                    | 1.26                       | 1.26         |
| 11                    | 1.68                       | 1.68         | 37                    | 1.48                       | 1.48         | 96                    | 1.22                       | 1.22         |
| 12                    | 1.67                       | 1.67         | 38                    | 1.48                       | 1.48         | 108                   | 1.17                       | 1.17         |
| 13                    | 1.65                       | 1.65         | 39                    | 1.47                       | 1.47         | 120                   | 1.13                       | 1.13         |
| 14                    | 1.64                       | 1.64         | 40                    | 1.47                       | 1.47         | 132                   | 1.10                       | 1.10         |
| 15                    | 1.63                       | 1.63         | 41                    | 1.46                       | 1.46         | 144                   | 1.06                       | 1.06         |
| 16                    | 1.63                       | 1.63         | 42                    | 1.46                       | 1.46         | 156                   | 1.02                       | 1.02         |
| 17                    | 1.62                       | 1.62         | 43                    | 1.45                       | 1.45         | 168                   | 0.99                       | 0.99         |
| 18                    | 1.61                       | 1.61         | 44                    | 1.44                       | 1.44         | 180                   | 0.96                       | 0.96         |
| 19                    | 1.60                       | 1.60         | 45                    | 1.44                       | 1.44         | 192                   | 0.93                       | 0.93         |
| 20                    | 1.59                       | 1.59         | 46                    | 1.44                       | 1.44         | 204                   | 0.90                       | 0.90         |
| 21                    | 1.58                       | 1.58         | 47                    | 1.43                       | 1.43         | 216                   | 0.87                       | 0.87         |
| 22                    | 1.58                       | 1.58         | 48                    | 1.43                       | 1.43         | 228                   | 0.84                       | 0.84         |
| 23                    | 1.57                       | 1.57         | 49                    | 1.42                       | 1.42         | 240                   | 0.82                       | 0.82         |
| 24                    | 1.56                       | 1.56         | 50                    | 1.42                       | 1.42         | 252                   | 0.79                       | 0.79         |
| 25                    | 1.56                       | 1.56         | 51                    | 1.41                       | 1.41         | 264                   | 0.77                       | 0.77         |





| CH2M HILL SLUG TEST DATA |  |  |  |  |  |  |  |  |
|--------------------------|--|--|--|--|--|--|--|--|
| PROJECT NO:              | 117612.G2.F2                                 |  |  |  |  |  |  |  |
| CLIENT:                  | MARZONE SUPERFUND SITE - Tifton, Georgia     |  |  |  |  |  |  |  |
| TEST DATE:               | 03/14/96                                     |  |  |  |  |  |  |  |
| WELL NO.:                | MW-3S  |  |  |  |  |  |  |  |
| COMPILED BY:             | MIKE WEATHERBY/GNV                           |  |  |  |  |  |  |  |
| TEST METHOD:             | SLUG OUT                                     |  |  |  |  |  |  |  |
| ANALYSIS METHOD:         | BOUWER and RICE - Partially Penetrating Well |  |  |  |  |  |  |  |

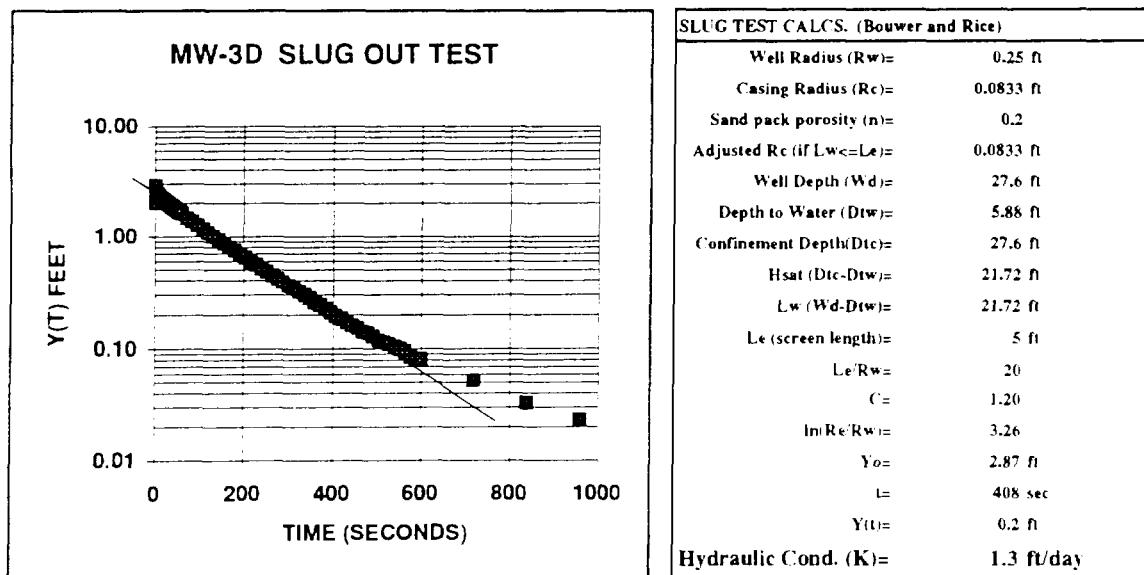
| ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) |
|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|
| 0                        | 4.93                          | 0.10         | 26                       | 5.77                          | 0.94         | 52                       | 5.74                          | 0.91         |
| 1                        | 5.48                          | 0.65         | 27                       | 5.77                          | 0.94         | 53                       | 5.74                          | 0.91         |
| 2                        | 5.84                          | 1.01         | 28                       | 5.77                          | 0.94         | 54                       | 5.74                          | 0.91         |
| 3                        | 5.83                          | 1.00         | 29                       | 5.77                          | 0.94         | 55                       | 5.74                          | 0.91         |
| 4                        | 5.82                          | 0.99         | 30                       | 5.76                          | 0.93         | 56                       | 5.73                          | 0.90         |
| 5                        | 5.82                          | 0.99         | 31                       | 5.76                          | 0.93         | 57                       | 5.73                          | 0.90         |
| 6                        | 5.81                          | 0.98         | 32                       | 5.76                          | 0.93         | 58                       | 5.73                          | 0.90         |
| 7                        | 5.81                          | 0.98         | 33                       | 5.76                          | 0.93         | 59                       | 5.73                          | 0.90         |
| 8                        | 5.81                          | 0.98         | 34                       | 5.76                          | 0.93         | 60                       | 5.73                          | 0.90         |
| 9                        | 5.81                          | 0.98         | 35                       | 5.76                          | 0.93         | 72                       | 5.72                          | 0.89         |
| 10                       | 5.80                          | 0.97         | 36                       | 5.76                          | 0.93         | 84                       | 5.70                          | 0.87         |
| 11                       | 5.80                          | 0.97         | 37                       | 5.75                          | 0.92         | 96                       | 5.69                          | 0.86         |
| 12                       | 5.80                          | 0.97         | 38                       | 5.75                          | 0.92         | 108                      | 5.68                          | 0.85         |
| 13                       | 5.79                          | 0.96         | 39                       | 5.75                          | 0.92         | 120                      | 5.67                          | 0.84         |
| 14                       | 5.79                          | 0.96         | 40                       | 5.75                          | 0.92         | 132                      | 5.65                          | 0.82         |
| 15                       | 5.79                          | 0.96         | 41                       | 5.75                          | 0.92         | 144                      | 5.64                          | 0.81         |
| 16                       | 5.79                          | 0.96         | 42                       | 5.75                          | 0.92         | 156                      | 5.63                          | 0.80         |
| 17                       | 5.79                          | 0.96         | 43                       | 5.75                          | 0.92         | 168                      | 5.62                          | 0.79         |
| 18                       | 5.78                          | 0.95         | 44                       | 5.75                          | 0.92         | 180                      | 5.60                          | 0.77         |
| 19                       | 5.78                          | 0.95         | 45                       | 5.75                          | 0.92         | 192                      | 5.59                          | 0.76         |
| 20                       | 5.78                          | 0.95         | 46                       | 5.75                          | 0.92         | 204                      | 5.58                          | 0.75         |
| 21                       | 5.78                          | 0.95         | 47                       | 5.74                          | 0.91         | 216                      | 5.57                          | 0.74         |
| 22                       | 5.78                          | 0.95         | 48                       | 5.74                          | 0.91         | 228                      | 5.56                          | 0.73         |
| 23                       | 5.78                          | 0.95         | 49                       | 5.74                          | 0.91         | 240                      | 5.55                          | 0.72         |
| 24                       | 5.77                          | 0.94         | 50                       | 5.74                          | 0.91         | 252                      | 5.53                          | 0.70         |
| 25                       | 5.77                          | 0.94         | 51                       | 5.74                          | 0.91         | 264                      | 5.52                          | 0.69         |





| CH2M HILL SLUG TEST DATA |  |  |  |  |  |  |  |  |
|--------------------------|--|--|--|--|--|--|--|--|
| PROJECT NO:              | H17612.G2.F2                             |  |  |  |  |  |  |  |
| CLIENT:                  | MARZONE SUPERFUND SITE - Tifton, Georgia |  |  |  |  |  |  |  |
| TEST DATE:               | 03/14/96                                 |  |  |  |  |  |  |  |
| WELL NO.:                | MW-3D                                    |  |  |  |  |  |  |  |
| COMPILED BY:             | MIKE WEATHERBY/GNV                       |  |  |  |  |  |  |  |
| TEST METHOD:             | SLUG OUT                                 |  |  |  |  |  |  |  |
| ANALYSIS METHOD:         | BOUWER and RICE - Fully Penetrating Well |  |  |  |  |  |  |  |

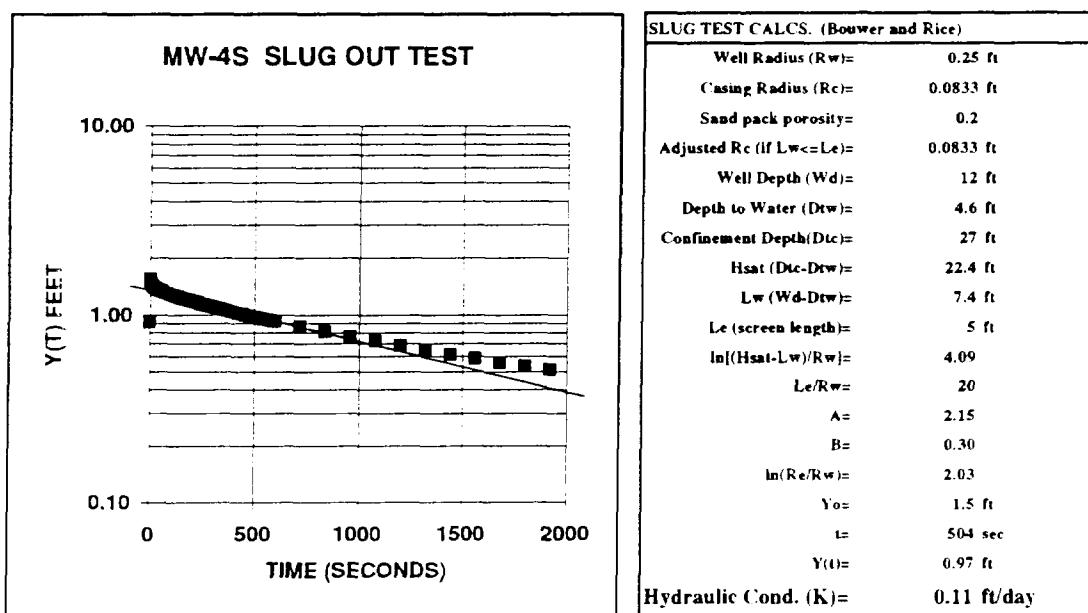
| ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) |
|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|
| 0                        | 5.88                          | 0.00         | 26                       | 7.91                          | 2.03         | 52                       | 7.58                          | 1.70         |
| 1                        | 7.91                          | 2.03         | 27                       | 7.89                          | 2.01         | 53                       | 7.56                          | 1.68         |
| 2                        | 8.75                          | 2.87         | 28                       | 7.88                          | 2.00         | 54                       | 7.55                          | 1.67         |
| 3                        | 8.37                          | 2.49         | 29                       | 7.87                          | 1.99         | 55                       | 7.54                          | 1.66         |
| 4                        | 8.33                          | 2.45         | 30                       | 7.85                          | 1.97         | 56                       | 7.53                          | 1.65         |
| 5                        | 8.29                          | 2.41         | 31                       | 7.84                          | 1.96         | 57                       | 7.52                          | 1.64         |
| 6                        | 8.27                          | 2.39         | 32                       | 7.82                          | 1.94         | 58                       | 7.51                          | 1.63         |
| 7                        | 8.24                          | 2.36         | 33                       | 7.81                          | 1.93         | 59                       | 7.50                          | 1.62         |
| 8                        | 8.22                          | 2.34         | 34                       | 7.80                          | 1.92         | 60                       | 7.49                          | 1.61         |
| 9                        | 8.20                          | 2.32         | 35                       | 7.79                          | 1.91         | 72                       | 7.36                          | 1.48         |
| 10                       | 8.18                          | 2.30         | 36                       | 7.77                          | 1.89         | 84                       | 7.25                          | 1.37         |
| 11                       | 8.16                          | 2.28         | 37                       | 7.76                          | 1.88         | 96                       | 7.15                          | 1.27         |
| 12                       | 8.14                          | 2.26         | 38                       | 7.75                          | 1.87         | 108                      | 7.05                          | 1.17         |
| 13                       | 8.12                          | 2.24         | 39                       | 7.73                          | 1.85         | 120                      | 6.97                          | 1.09         |
| 14                       | 8.10                          | 2.22         | 40                       | 7.72                          | 1.84         | 132                      | 6.89                          | 1.01         |
| 15                       | 8.09                          | 2.21         | 41                       | 7.71                          | 1.83         | 144                      | 6.81                          | 0.93         |
| 16                       | 8.07                          | 2.19         | 42                       | 7.69                          | 1.81         | 156                      | 6.74                          | 0.86         |
| 17                       | 8.06                          | 2.18         | 43                       | 7.68                          | 1.80         | 168                      | 6.68                          | 0.80         |
| 18                       | 8.04                          | 2.16         | 44                       | 7.67                          | 1.79         | 180                      | 6.62                          | 0.74         |
| 19                       | 8.02                          | 2.14         | 45                       | 7.66                          | 1.78         | 192                      | 6.57                          | 0.69         |
| 20                       | 8.00                          | 2.12         | 46                       | 7.65                          | 1.77         | 204                      | 6.52                          | 0.64         |
| 21                       | 7.99                          | 2.11         | 47                       | 7.63                          | 1.75         | 216                      | 6.48                          | 0.60         |
| 22                       | 7.97                          | 2.09         | 48                       | 7.62                          | 1.74         | 228                      | 6.44                          | 0.56         |
| 23                       | 7.96                          | 2.08         | 49                       | 7.61                          | 1.73         | 240                      | 6.40                          | 0.52         |
| 24                       | 7.94                          | 2.06         | 50                       | 7.60                          | 1.72         | 252                      | 6.36                          | 0.48         |
| 25                       | 7.93                          | 2.05         | 51                       | 7.59                          | 1.71         | 264                      | 6.33                          | 0.45         |





| CH2M HILL SLUG TEST DATA |  |  |  |  |  |  |  |  |
|--------------------------|--|--|--|--|--|--|--|--|
| PROJECT NO:              | 117612.G2.F2                                 |  |  |  |  |  |  |  |
| CLIENT:                  | MARZONE SUPERFUND SITE - Tifton, Georgia     |  |  |  |  |  |  |  |
| TEST DATE:               | 03/14/96                                     |  |  |  |  |  |  |  |
| WELL NO.:                | MW-4S  |  |  |  |  |  |  |  |
| COMPILED BY:             | MIKE WEATHERBY/GNV                           |  |  |  |  |  |  |  |
| TEST METHOD:             | SLUG OUT                                     |  |  |  |  |  |  |  |
| ANALYSIS METHOD:         | BOUWER and RICE - Partially Penetrating Well |  |  |  |  |  |  |  |

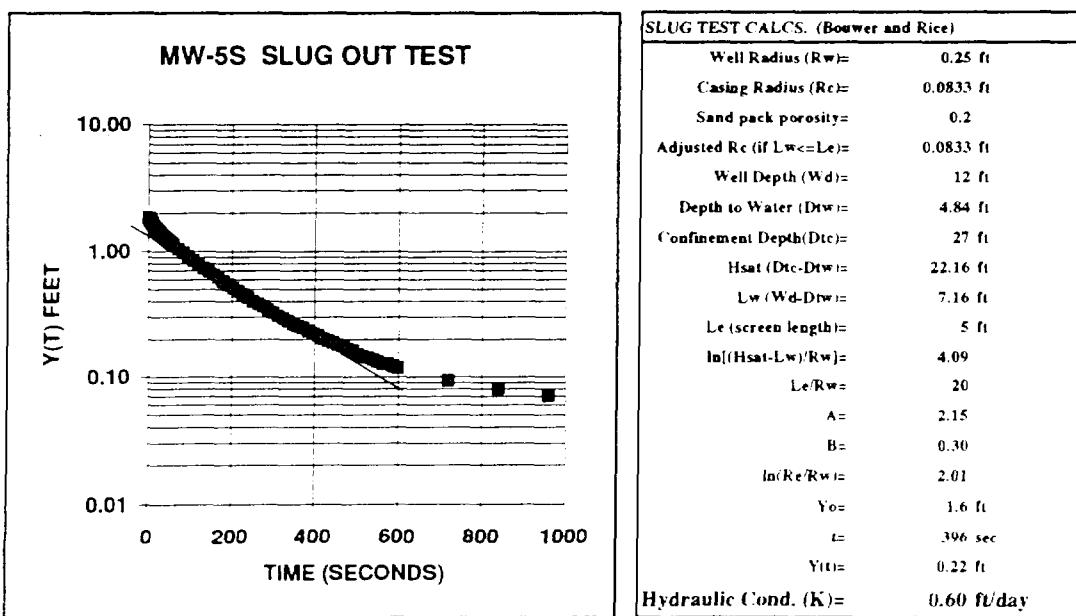
| ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) |
|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|
| 0                        | 4.60                          | 0.00         | 26                       | 5.98                          | 1.38         | 52                       | 5.94                          | 1.34         |
| 1                        | 5.52                          | 0.92         | 27                       | 5.98                          | 1.38         | 53                       | 5.94                          | 1.34         |
| 2                        | 6.15                          | 1.55         | 28                       | 5.98                          | 1.38         | 54                       | 5.93                          | 1.33         |
| 3                        | 6.10                          | 1.50         | 29                       | 5.98                          | 1.38         | 55                       | 5.93                          | 1.33         |
| 4                        | 6.08                          | 1.48         | 30                       | 5.97                          | 1.37         | 56                       | 5.93                          | 1.33         |
| 5                        | 6.07                          | 1.47         | 31                       | 5.97                          | 1.37         | 57                       | 5.93                          | 1.33         |
| 6                        | 6.06                          | 1.46         | 32                       | 5.97                          | 1.37         | 58                       | 5.93                          | 1.33         |
| 7                        | 6.05                          | 1.45         | 33                       | 5.97                          | 1.37         | 59                       | 5.93                          | 1.33         |
| 8                        | 6.05                          | 1.45         | 34                       | 5.97                          | 1.37         | 60                       | 5.93                          | 1.33         |
| 9                        | 6.04                          | 1.44         | 35                       | 5.96                          | 1.36         | 72                       | 5.91                          | 1.31         |
| 10                       | 6.03                          | 1.43         | 36                       | 5.96                          | 1.36         | 84                       | 5.90                          | 1.30         |
| 11                       | 6.03                          | 1.43         | 37                       | 5.96                          | 1.36         | 96                       | 5.88                          | 1.28         |
| 12                       | 6.02                          | 1.42         | 38                       | 5.96                          | 1.36         | 108                      | 5.87                          | 1.27         |
| 13                       | 6.02                          | 1.42         | 39                       | 5.96                          | 1.36         | 120                      | 5.86                          | 1.26         |
| 14                       | 6.02                          | 1.42         | 40                       | 5.96                          | 1.36         | 132                      | 5.84                          | 1.24         |
| 15                       | 6.02                          | 1.42         | 41                       | 5.96                          | 1.36         | 144                      | 5.83                          | 1.23         |
| 16                       | 6.01                          | 1.41         | 42                       | 5.95                          | 1.35         | 156                      | 5.82                          | 1.22         |
| 17                       | 6.01                          | 1.41         | 43                       | 5.95                          | 1.35         | 168                      | 5.81                          | 1.21         |
| 18                       | 6.00                          | 1.40         | 44                       | 5.95                          | 1.35         | 180                      | 5.80                          | 1.20         |
| 19                       | 6.00                          | 1.40         | 45                       | 5.95                          | 1.35         | 192                      | 5.79                          | 1.19         |
| 20                       | 6.00                          | 1.40         | 46                       | 5.94                          | 1.34         | 204                      | 5.78                          | 1.18         |
| 21                       | 6.00                          | 1.40         | 47                       | 5.94                          | 1.34         | 216                      | 5.77                          | 1.17         |
| 22                       | 5.99                          | 1.39         | 48                       | 5.94                          | 1.34         | 228                      | 5.76                          | 1.16         |
| 23                       | 5.99                          | 1.39         | 49                       | 5.94                          | 1.34         | 240                      | 5.75                          | 1.15         |
| 24                       | 5.99                          | 1.39         | 50                       | 5.94                          | 1.34         | 252                      | 5.74                          | 1.14         |
| 25                       | 5.98                          | 1.38         | 51                       | 5.94                          | 1.34         | 264                      | 5.73                          | 1.13         |





| CH2M HILL SLUG TEST DATA                                      |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|
| PROJECT NO:   | 117612.G2.F2                             |  |  |  |  |  |  |  |
| CLIENT:   | MARZONE SUPERFUND SITE - Tifton, Georgia |  |  |  |  |  |  |  |
| TEST DATE:  | 03/15/96                                 |  |  |  |  |  |  |  |
| WELL NO.:   | MW-5S                                    |  |  |  |  |  |  |  |
| COMPILED BY:  | MIKE WEATHERBY/GNV                       |  |  |  |  |  |  |  |
| TEST METHOD:  | SLUG OUT                                 |  |  |  |  |  |  |  |
| ANALYSIS METHOD: BOUWER and RICE - Partially Penetrating Well |  |  |  |  |  |  |  |  |

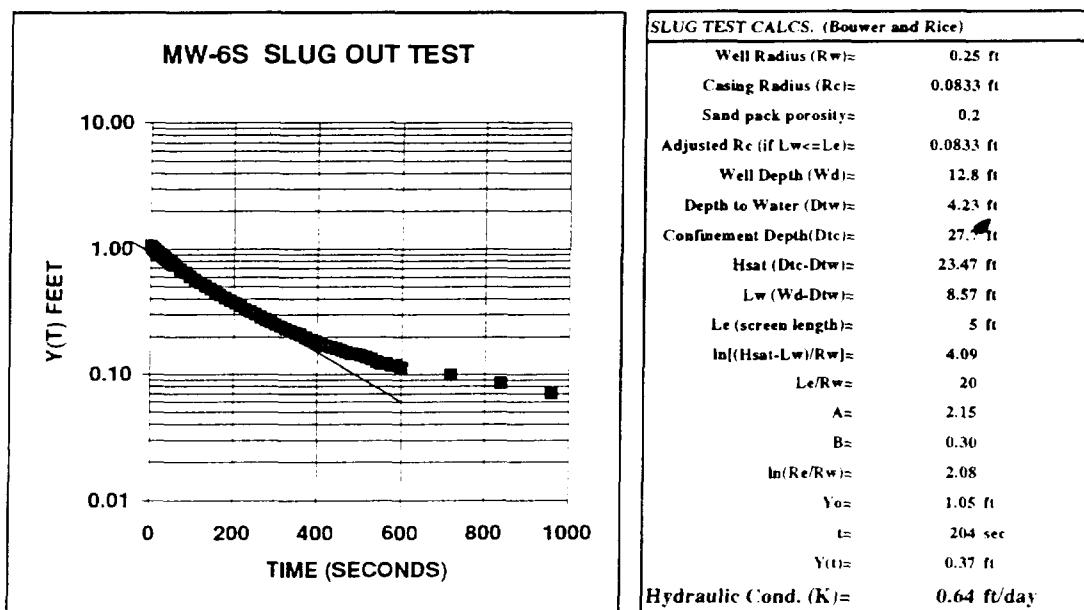
| ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) |
|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|
| 0                        | 6.57                          | 1.73         | 26                       | 6.27                          | 1.43         | 52                       | 6.02                          | 1.18         |
| 1                        | 6.69                          | 1.85         | 27                       | 6.26                          | 1.42         | 53                       | 6.01                          | 1.17         |
| 2                        | 6.69                          | 1.85         | 28                       | 6.25                          | 1.41         | 54                       | 6.01                          | 1.17         |
| 3                        | 6.66                          | 1.82         | 29                       | 6.24                          | 1.40         | 55                       | 6.00                          | 1.16         |
| 4                        | 6.63                          | 1.79         | 30                       | 6.22                          | 1.38         | 56                       | 6.00                          | 1.16         |
| 5                        | 6.61                          | 1.77         | 31                       | 6.21                          | 1.37         | 57                       | 5.99                          | 1.15         |
| 6                        | 6.58                          | 1.74         | 32                       | 6.20                          | 1.36         | 58                       | 5.98                          | 1.14         |
| 7                        | 6.56                          | 1.72         | 33                       | 6.19                          | 1.35         | 59                       | 5.97                          | 1.13         |
| 8                        | 6.54                          | 1.70         | 34                       | 6.18                          | 1.34         | 60                       | 5.97                          | 1.13         |
| 9                        | 6.52                          | 1.68         | 35                       | 6.17                          | 1.33         | 72                       | 5.88                          | 1.04         |
| 10                       | 6.50                          | 1.66         | 36                       | 6.16                          | 1.32         | 84                       | 5.81                          | 0.97         |
| 11                       | 6.48                          | 1.64         | 37                       | 6.15                          | 1.31         | 96                       | 5.74                          | 0.90         |
| 12                       | 6.47                          | 1.63         | 38                       | 6.14                          | 1.30         | 108                      | 5.69                          | 0.85         |
| 13                       | 6.45                          | 1.61         | 39                       | 6.13                          | 1.29         | 120                      | 5.63                          | 0.79         |
| 14                       | 6.44                          | 1.60         | 40                       | 6.12                          | 1.28         | 132                      | 5.57                          | 0.73         |
| 15                       | 6.42                          | 1.58         | 41                       | 6.11                          | 1.27         | 144                      | 5.53                          | 0.69         |
| 16                       | 6.40                          | 1.56         | 42                       | 6.10                          | 1.26         | 156                      | 5.49                          | 0.65         |
| 17                       | 6.39                          | 1.55         | 43                       | 6.09                          | 1.25         | 168                      | 5.46                          | 0.62         |
| 18                       | 6.37                          | 1.53         | 44                       | 6.09                          | 1.25         | 180                      | 5.42                          | 0.58         |
| 19                       | 6.36                          | 1.52         | 45                       | 6.08                          | 1.24         | 192                      | 5.38                          | 0.54         |
| 20                       | 6.35                          | 1.51         | 46                       | 6.07                          | 1.23         | 204                      | 5.35                          | 0.51         |
| 21                       | 6.33                          | 1.49         | 47                       | 6.07                          | 1.23         | 216                      | 5.32                          | 0.48         |
| 22                       | 6.32                          | 1.48         | 48                       | 6.06                          | 1.22         | 228                      | 5.30                          | 0.46         |
| 23                       | 6.31                          | 1.47         | 49                       | 6.05                          | 1.21         | 240                      | 5.27                          | 0.43         |
| 24                       | 6.30                          | 1.46         | 50                       | 6.04                          | 1.20         | 252                      | 5.24                          | 0.40         |
| 25                       | 6.28                          | 1.44         | 51                       | 6.03                          | 1.19         | 264                      | 5.22                          | 0.38         |





| CH2M HILL SLUG TEST DATA |  |  |  |  |  |  |  |
|--------------------------|--|--|--|--|--|--|--|
| PROJECT NO:              | 117612.G2.F2                                 |  |  |  |  |  |  |
| CLIENT:                  | MARZONE SUPERFUND SITE - Tifton, Georgia     |  |  |  |  |  |  |
| TEST DATE:               | 03/15/96                                     |  |  |  |  |  |  |
| WELL NO.:                | MW-6S  |  |  |  |  |  |  |
| COMPILED BY:             | MIKE WEATHERBY/GNV                           |  |  |  |  |  |  |
| TEST METHOD:             | SLUG OUT                                     |  |  |  |  |  |  |
| ANALYSIS METHOD:         | BOUWER and RICE - Partially Penetrating Well |  |  |  |  |  |  |

| ELAPSED TIME<br>(sec) | TRANSDUCER READING<br>(ft) | Y(t)<br>(ft) | ELAPSED TIME<br>(sec) | TRANSDUCER READING<br>(ft) | Y(t)<br>(ft) | ELAPSED TIME<br>(sec) | TRANSDUCER READING<br>(ft) | Y(t)<br>(ft) |
|-----------------------|----------------------------|--------------|-----------------------|----------------------------|--------------|-----------------------|----------------------------|--------------|
| 0                     | 4.75                       | 0.52         | 26                    | 5.12                       | 0.89         | 52                    | 4.99                       | 0.76         |
| 1                     | 5.28                       | 1.05         | 27                    | 5.11                       | 0.88         | 53                    | 4.99                       | 0.76         |
| 2                     | 5.28                       | 1.05         | 28                    | 5.11                       | 0.88         | 54                    | 4.99                       | 0.76         |
| 3                     | 5.27                       | 1.04         | 29                    | 5.10                       | 0.87         | 55                    | 4.98                       | 0.75         |
| 4                     | 5.26                       | 1.03         | 30                    | 5.09                       | 0.86         | 56                    | 4.98                       | 0.75         |
| 5                     | 5.25                       | 1.02         | 31                    | 5.09                       | 0.86         | 57                    | 4.97                       | 0.74         |
| 6                     | 5.24                       | 1.01         | 32                    | 5.09                       | 0.86         | 58                    | 4.97                       | 0.74         |
| 7                     | 5.23                       | 1.00         | 33                    | 5.08                       | 0.85         | 59                    | 4.96                       | 0.73         |
| 8                     | 5.22                       | 0.99         | 34                    | 5.07                       | 0.84         | 60                    | 4.96                       | 0.73         |
| 9                     | 5.22                       | 0.98         | 35                    | 5.07                       | 0.84         | 72                    | 4.92                       | 0.69         |
| 10                    | 5.21                       | 0.98         | 36                    | 5.06                       | 0.83         | 84                    | 4.87                       | 0.64         |
| 11                    | 5.21                       | 0.98         | 37                    | 5.06                       | 0.83         | 96                    | 4.84                       | 0.61         |
| 12                    | 5.20                       | 0.97         | 38                    | 5.05                       | 0.82         | 108                   | 4.80                       | 0.57         |
| 13                    | 5.19                       | 0.96         | 39                    | 5.05                       | 0.82         | 120                   | 4.77                       | 0.54         |
| 14                    | 5.19                       | 0.96         | 40                    | 5.04                       | 0.81         | 132                   | 4.74                       | 0.51         |
| 15                    | 5.18                       | 0.95         | 41                    | 5.04                       | 0.81         | 144                   | 4.71                       | 0.48         |
| 16                    | 5.17                       | 0.94         | 42                    | 5.04                       | 0.81         | 156                   | 4.68                       | 0.45         |
| 17                    | 5.16                       | 0.93         | 43                    | 5.04                       | 0.81         | 168                   | 4.66                       | 0.43         |
| 18                    | 5.16                       | 0.93         | 44                    | 5.03                       | 0.80         | 180                   | 4.64                       | 0.41         |
| 19                    | 5.15                       | 0.92         | 45                    | 5.02                       | 0.79         | 192                   | 4.62                       | 0.39         |
| 20                    | 5.15                       | 0.92         | 46                    | 5.02                       | 0.79         | 204                   | 4.60                       | 0.37         |
| 21                    | 5.14                       | 0.91         | 47                    | 5.02                       | 0.79         | 216                   | 4.59                       | 0.36         |
| 22                    | 5.13                       | 0.90         | 48                    | 5.01                       | 0.78         | 228                   | 4.56                       | 0.33         |
| 23                    | 5.13                       | 0.90         | 49                    | 5.01                       | 0.78         | 240                   | 4.55                       | 0.32         |
| 24                    | 5.13                       | 0.90         | 50                    | 5.00                       | 0.77         | 252                   | 4.53                       | 0.30         |
| 25                    | 5.12                       | 0.89         | 51                    | 5.00                       | 0.77         | 264                   | 4.52                       | 0.29         |

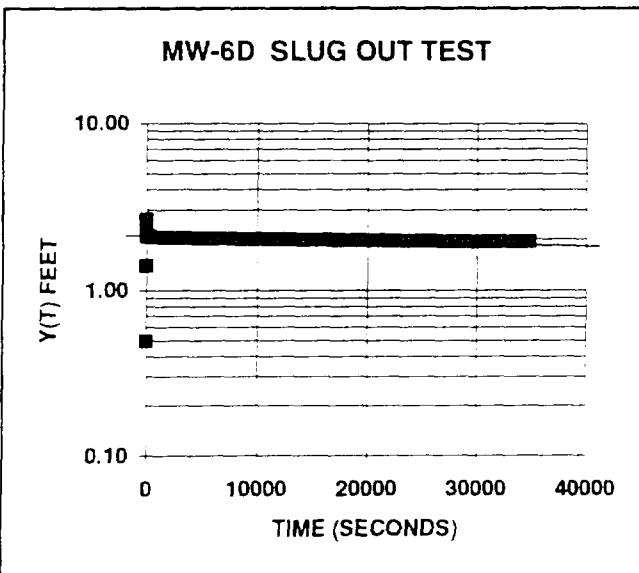




## **CH2M HILL SLUG TEST DATA**

|                  |  |
|------------------|--|
| PROJECT NO:      | 117612.G2.F2                             |
| CLIENT:          | MARZONE SUPERFUND SITE - Tifton, Georgia |
| TEST DATE:       | 03/14/96                                 |
| WELL NO.:        | MW-6D                                    |
| COMPILED BY:     | MIKE WEATHERBY/GNV                       |
| TEST METHOD:     | SLUG OUT                                 |
| ANALYSIS METHOD: | BOUWER and RICE - Fully Penetrating Well |

| ELAPSED TIME |      |      | TRANSDUCER READING |      |      | ELAPSED TIME |      |      | TRANSDUCER READING |      |      |
|--------------|------|------|--------------------|------|------|--------------|------|------|--------------------|------|------|
|              | sec) | (ft) |                    | sec) | (ft) |              | sec) | (ft) |                    | sec) | (ft) |
| 0            |      | 5.65 | 0.01               |      | 26   | 7.77         | 2.13 |      | 52                 | 7.73 | 2.09 |
| 1            |      | 6.13 | 0.50               |      | 27   | 7.76         | 2.12 |      | 53                 | 7.73 | 2.09 |
| 2            |      | 7.03 | 1.39               |      | 28   | 7.76         | 2.12 |      | 54                 | 7.73 | 2.09 |
| 3            |      | 8.28 | 2.65               |      | 29   | 7.76         | 2.12 |      | 55                 | 7.73 | 2.09 |
| 4            |      | 8.05 | 2.41               |      | 30   | 7.76         | 2.12 |      | 56                 | 7.73 | 2.09 |
| 5            |      | 7.94 | 2.30               |      | 31   | 7.75         | 2.12 |      | 57                 | 7.73 | 2.09 |
| 6            |      | 7.91 | 2.27               |      | 32   | 7.75         | 2.12 |      | 58                 | 7.73 | 2.09 |
| 7            |      | 7.90 | 2.26               |      | 33   | 7.75         | 2.11 |      | 59                 | 7.73 | 2.09 |
| 8            |      | 7.89 | 2.25               |      | 34   | 7.75         | 2.11 |      | 60                 | 7.73 | 2.09 |
| 9            |      | 7.88 | 2.24               |      | 35   | 7.75         | 2.11 |      | 72                 | 7.73 | 2.09 |
| 10           |      | 7.86 | 2.22               |      | 36   | 7.74         | 2.11 |      | 84                 | 7.73 | 2.09 |
| 11           |      | 7.85 | 2.21               |      | 37   | 7.74         | 2.11 |      | 96                 | 7.72 | 2.08 |
| 12           |      | 7.84 | 2.20               |      | 38   | 7.74         | 2.11 |      | 108                | 7.72 | 2.08 |
| 13           |      | 7.83 | 2.19               |      | 39   | 7.74         | 2.10 |      | 120                | 7.72 | 2.08 |
| 14           |      | 7.82 | 2.19               |      | 40   | 7.74         | 2.10 |      | 132                | 7.72 | 2.08 |
| 15           |      | 7.82 | 2.18               |      | 41   | 7.74         | 2.10 |      | 144                | 7.72 | 2.08 |
| 16           |      | 7.81 | 2.17               |      | 42   | 7.74         | 2.10 |      | 156                | 7.72 | 2.08 |
| 17           |      | 7.81 | 2.17               |      | 43   | 7.74         | 2.10 |      | 168                | 7.72 | 2.08 |
| 18           |      | 7.80 | 2.16               |      | 44   | 7.74         | 2.10 |      | 180                | 7.72 | 2.08 |
| 19           |      | 7.80 | 2.16               |      | 45   | 7.74         | 2.10 |      | 192                | 7.72 | 2.08 |
| 20           |      | 7.79 | 2.15               |      | 46   | 7.74         | 2.10 |      | 204                | 7.72 | 2.08 |
| 21           |      | 7.78 | 2.14               |      | 47   | 7.74         | 2.10 |      | 216                | 7.72 | 2.08 |
| 22           |      | 7.78 | 2.14               |      | 48   | 7.74         | 2.10 |      | 228                | 7.72 | 2.08 |
| 23           |      | 7.78 | 2.14               |      | 49   | 7.74         | 2.10 |      | 240                | 7.72 | 2.08 |
| 24           |      | 7.77 | 2.13               |      | 50   | 7.74         | 2.10 |      | 252                | 7.72 | 2.08 |
| 25           |      | 7.77 | 2.13               |      | 51   | 7.73         | 2.09 |      | 264                | 7.71 | 2.07 |

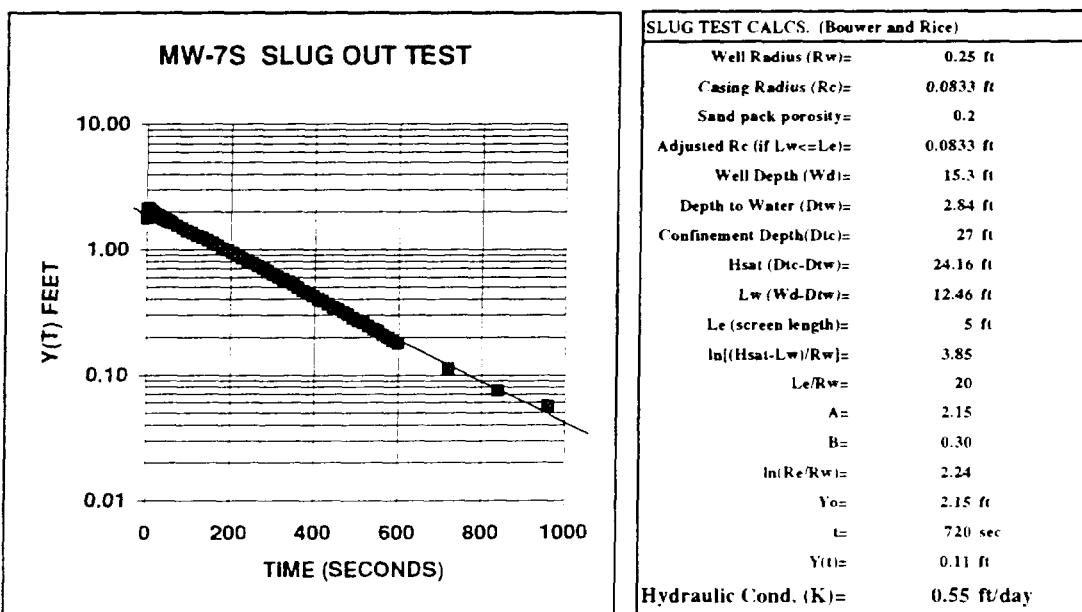


| <b>SLUG TEST CALCS. (Bouwer and Rice)</b> |                      |
|---|----------------------|
| Well Radius ( $R_w$ )=                    | 0.25 ft              |
| Casing Radius ( $R_c$ )=                  | 0.0833 ft            |
| Sand pack porosity ( $n$ )=               | 0.2                  |
| Adjusted $R_c$ (if $L_w \leq L_e$ )=      | 0.0833 ft            |
| Well Depth ( $W_d$ )=                     | 27.7 ft              |
| Depth to Water ( $D_{tw}$ )=              | 5.64 ft              |
| Confinement Depth ( $D_{tc}$ )=           | 27.7 ft              |
| $H_{sat}$ ( $D_{tc} - D_{tw}$ )=          | 22.06 ft             |
| $L_w$ ( $W_d - D_{tw}$ )=                 | 22.06 ft             |
| $L_e$ (screen length)=                    | 5 ft                 |
| $L_e/R_w$ =                               | 20                   |
| $C$ =                                     | 1.70                 |
| $\ln(R_c/R_w)$ =                          | 3.03                 |
| $Y_o$ =                                   | 2.65 ft              |
| $t$ =                                     | 33000 sec            |
| $Y(t)$ =                                  | 1.93 ft              |
| <b>Hydraulic Cond. (<math>K</math>)=</b>  | <b>0.0017 ft/day</b> |



| CH2M HILL SLUG TEST DATA |  |  |  |  |  |  |  |  |
|--------------------------|--|--|--|--|--|--|--|--|
| PROJECT NO:              | 117612.G2.F2                                 |  |  |  |  |  |  |  |
| CLIENT:                  | MARZONE SUPERFUND SITE - Tifton, Georgia     |  |  |  |  |  |  |  |
| TEST DATE:               | 03/15/96                                     |  |  |  |  |  |  |  |
| WELL NO.:                | MW-7S  |  |  |  |  |  |  |  |
| COMPILED BY:             | MIKE WEATHERBY/GNV                           |  |  |  |  |  |  |  |
| TEST METHOD:             | SLUG OUT                                     |  |  |  |  |  |  |  |
| ANALYSIS METHOD:         | BOUWER and RICE - Partially Penetrating Well |  |  |  |  |  |  |  |

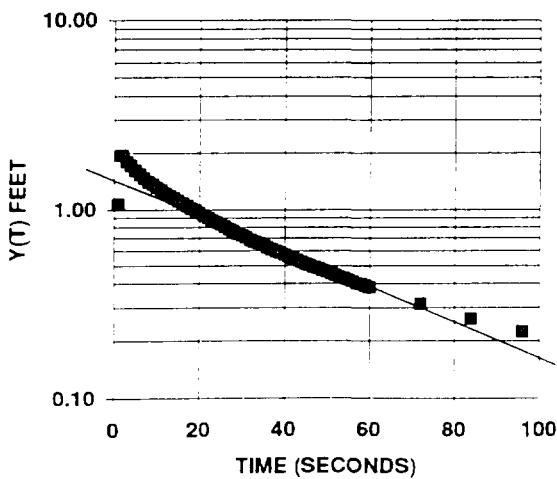
| ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) |
|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|
| 0                        | 2.84                          | 0.00         | 26                       | 4.71                          | 1.87         | 52                       | 4.52                          | 1.68         |
| 1                        | 4.62                          | 1.78         | 27                       | 4.70                          | 1.86         | 53                       | 4.51                          | 1.67         |
| 2                        | 4.98                          | 2.14         | 28                       | 4.69                          | 1.85         | 54                       | 4.51                          | 1.67         |
| 3                        | 4.90                          | 2.06         | 29                       | 4.69                          | 1.85         | 55                       | 4.50                          | 1.66         |
| 4                        | 4.99                          | 2.15         | 30                       | 4.68                          | 1.84         | 56                       | 4.49                          | 1.65         |
| 5                        | 4.93                          | 2.09         | 31                       | 4.67                          | 1.83         | 57                       | 4.49                          | 1.65         |
| 6                        | 4.92                          | 2.08         | 32                       | 4.66                          | 1.82         | 58                       | 4.48                          | 1.64         |
| 7                        | 4.91                          | 2.07         | 33                       | 4.65                          | 1.81         | 59                       | 4.48                          | 1.64         |
| 8                        | 4.89                          | 2.05         | 34                       | 4.64                          | 1.80         | 60                       | 4.47                          | 1.63         |
| 9                        | 4.88                          | 2.04         | 35                       | 4.64                          | 1.80         | 72                       | 4.40                          | 1.56         |
| 10                       | 4.87                          | 2.03         | 36                       | 4.63                          | 1.79         | 84                       | 4.33                          | 1.49         |
| 11                       | 4.86                          | 2.02         | 37                       | 4.62                          | 1.78         | 96                       | 4.26                          | 1.42         |
| 12                       | 4.84                          | 2.00         | 38                       | 4.61                          | 1.77         | 108                      | 4.20                          | 1.36         |
| 13                       | 4.83                          | 1.99         | 39                       | 4.61                          | 1.77         | 120                      | 4.13                          | 1.29         |
| 14                       | 4.82                          | 1.98         | 40                       | 4.61                          | 1.77         | 132                      | 4.08                          | 1.24         |
| 15                       | 4.81                          | 1.97         | 41                       | 4.60                          | 1.76         | 144                      | 4.02                          | 1.18         |
| 16                       | 4.80                          | 1.96         | 42                       | 4.59                          | 1.75         | 156                      | 3.97                          | 1.13         |
| 17                       | 4.79                          | 1.95         | 43                       | 4.58                          | 1.74         | 168                      | 3.92                          | 1.08         |
| 18                       | 4.78                          | 1.94         | 44                       | 4.58                          | 1.74         | 180                      | 3.87                          | 1.03         |
| 19                       | 4.77                          | 1.93         | 45                       | 4.57                          | 1.73         | 192                      | 3.82                          | 0.98         |
| 20                       | 4.76                          | 1.92         | 46                       | 4.56                          | 1.72         | 204                      | 3.78                          | 0.94         |
| 21                       | 4.75                          | 1.91         | 47                       | 4.55                          | 1.71         | 216                      | 3.73                          | 0.89         |
| 22                       | 4.74                          | 1.90         | 48                       | 4.54                          | 1.70         | 228                      | 3.69                          | 0.85         |
| 23                       | 4.73                          | 1.89         | 49                       | 4.54                          | 1.70         | 240                      | 3.65                          | 0.81         |
| 24                       | 4.72                          | 1.88         | 50                       | 4.53                          | 1.69         | 252                      | 3.61                          | 0.77         |
| 25                       | 4.71                          | 1.87         | 51                       | 4.52                          | 1.68         | 264                      | 3.58                          | 0.74         |




**CH2M HILL SLUG TEST DATA**

**PROJECT NO:** 117612.G2.F2  
**CLIENT:** MARZONE SUPERFUND SITE - Tifton, Georgia  
**TEST DATE:** 03/15/96  
**WELL NO.:** MW-9S  
**COMPILED BY:** MIKE WEATHERBY/GNV  
**TEST METHOD:** SLUG OUT  
**ANALYSIS METHOD:** BOUWER and RICE - Partially Penetrating Well

| ELAPSED TIME | TRANSDUCER READING | Y(t) | ELAPSED TIME | TRANSDUCER READING | Y(t) | ELAPSED TIME | TRANSDUCER READING | Y(t) |
|--------------|--------------------|------|--------------|--------------------|------|--------------|--------------------|------|
| (sec)        | (ft)               | (ft) | (sec)        | (ft)               | (ft) | (sec)        | (ft)               | (ft) |
| 0            | 3.41               | 0.00 | 26           | 4.22               | 0.81 | 52           | 3.86               | 0.45 |
| 1            | 4.47               | 1.06 | 27           | 4.20               | 0.79 | 53           | 3.85               | 0.44 |
| 2            | 5.36               | 1.95 | 28           | 4.18               | 0.77 | 54           | 3.84               | 0.43 |
| 3            | 5.21               | 1.80 | 29           | 4.15               | 0.74 | 55           | 3.83               | 0.42 |
| 4            | 5.12               | 1.71 | 30           | 4.13               | 0.72 | 56           | 3.82               | 0.41 |
| 5            | 5.03               | 1.62 | 31           | 4.12               | 0.71 | 57           | 3.81               | 0.40 |
| 6            | 4.95               | 1.54 | 32           | 4.10               | 0.69 | 58           | 3.81               | 0.40 |
| 7            | 4.88               | 1.47 | 33           | 4.08               | 0.67 | 59           | 3.80               | 0.39 |
| 8            | 4.82               | 1.41 | 34           | 4.07               | 0.66 | 60           | 3.79               | 0.38 |
| 9            | 4.76               | 1.35 | 35           | 4.05               | 0.64 | 72           | 3.72               | 0.31 |
| 10           | 4.72               | 1.31 | 36           | 4.04               | 0.63 | 84           | 3.67               | 0.26 |
| 11           | 4.67               | 1.26 | 37           | 4.02               | 0.61 | 96           | 3.63               | 0.22 |
| 12           | 4.63               | 1.22 | 38           | 4.01               | 0.60 | 108          | 3.60               | 0.19 |
| 13           | 4.59               | 1.18 | 39           | 4.00               | 0.59 | 120          | 3.58               | 0.17 |
| 14           | 4.56               | 1.15 | 40           | 3.98               | 0.57 | 132          | 3.56               | 0.15 |
| 15           | 4.52               | 1.11 | 41           | 3.97               | 0.56 | 144          | 3.54               | 0.13 |
| 16           | 4.49               | 1.08 | 42           | 3.96               | 0.55 | 156          | 3.53               | 0.12 |
| 17           | 4.45               | 1.04 | 43           | 3.95               | 0.54 | 168          | 3.52               | 0.11 |
| 18           | 4.42               | 1.01 | 44           | 3.93               | 0.52 | 180          | 3.51               | 0.10 |
| 19           | 4.40               | 0.98 | 45           | 3.92               | 0.51 | 192          | 3.50               | 0.09 |
| 20           | 4.37               | 0.96 | 46           | 3.91               | 0.50 | 204          | 3.50               | 0.09 |
| 21           | 4.34               | 0.93 | 47           | 3.90               | 0.49 | 216          | 3.49               | 0.07 |
| 22           | 4.31               | 0.90 | 48           | 3.89               | 0.48 | 228          | 3.49               | 0.07 |
| 23           | 4.29               | 0.88 | 49           | 3.88               | 0.47 | 240          | 3.48               | 0.07 |
| 24           | 4.26               | 0.85 | 50           | 3.87               | 0.46 | 252          | 3.48               | 0.07 |
| 25           | 4.24               | 0.83 | 51           | 3.86               | 0.45 | 264          | 3.47               | 0.06 |

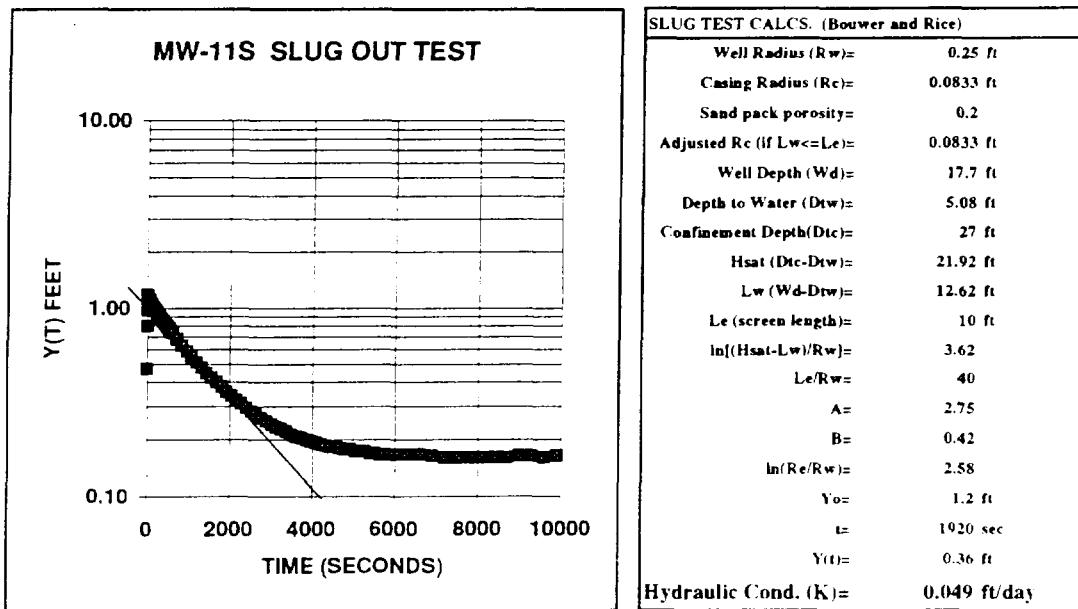
**MW-9S SLUG OUT TEST**

**SLUG TEST CALCS. (Bouwer and Rice)**

|                                       |            |
|---------------------------------------|------------|
| Well Radius ( $R_w$ ) =               | 0.25 ft    |
| Casing Radius ( $R_c$ ) =             | 0.0833 ft  |
| Sand pack porosity =                  | 0.2        |
| Adjusted $R_c$ (if $L_w \leq L_e$ ) = | 0.0833 ft  |
| Well Depth ( $D_w$ ) =                | 12.6 ft    |
| Depth to Water ( $D_{tw}$ ) =         | 3.41 ft    |
| Confinement Depth ( $D_{tc}$ ) =      | 27 ft      |
| $H_{sat} (D_{tc}-D_{tw})$ =           | 23.59 ft   |
| $L_w (D_w-D_{tw})$ =                  | 9.19 ft    |
| $L_e$ (screen length) =               | 5 ft       |
| $\ln(H_{sat}-L_w)/R_w$ =              | 4.05       |
| $L_e/R_w$ =                           | 20         |
| A =                                   | 2.15       |
| B =                                   | 0.30       |
| $\ln(R_c/R_w)$ =                      | 2.11       |
| $Y_{os}$ =                            | 1.5 ft     |
| t =                                   | 60 sec     |
| Y(t) =                                | 0.38 ft    |
| Hydraulic Cond. (K) =                 | 2.9 ft/day |



| CH2M HILL SLUG TEST DATA |  |  |  |  |  |  |  |
|--------------------------|--|--|--|--|--|--|--|
| PROJECT NO:              | 117612.G2.F2                                 |  |  |  |  |  |  |
| CLIENT:                  | MARZONE SUPERFUND SITE - Tifton, Georgia     |  |  |  |  |  |  |
| TEST DATE:               | 03/14/96                                     |  |  |  |  |  |  |
| WELL NO.:                | MW-11S                                       |  |  |  |  |  |  |
| COMPILED BY:             | MIKE WEATHERBY/GNV                           |  |  |  |  |  |  |
| TEST METHOD:             | SLUG OUT                                     |  |  |  |  |  |  |
| ANALYSIS METHOD:         | BOUWER and RICE - Partially Penetrating Well |  |  |  |  |  |  |

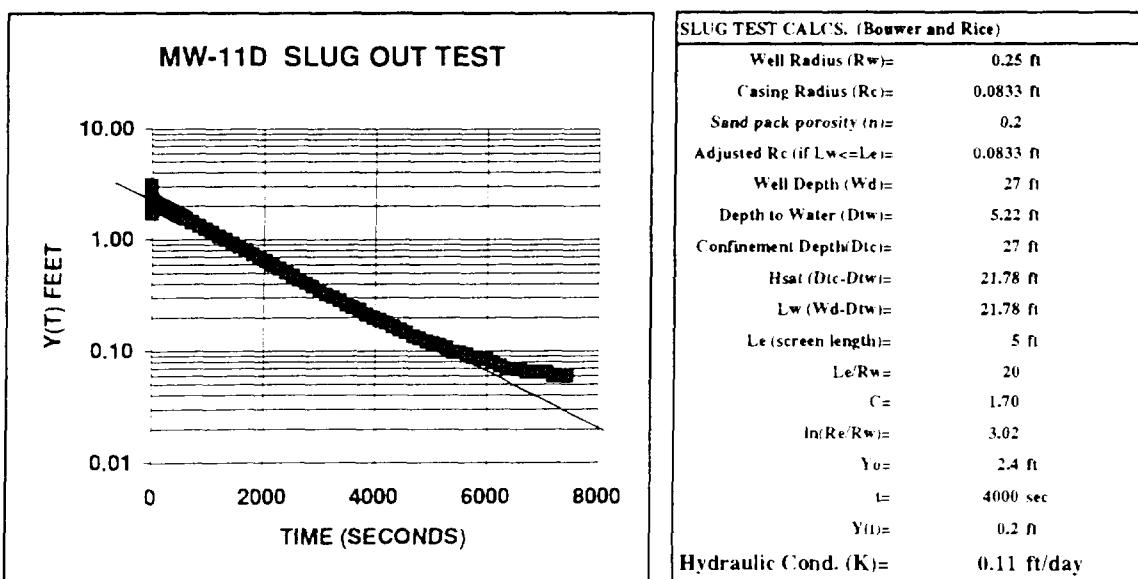
| ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) |
|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|
| 0                        | 5.11                          | 0.03         | 26                       | 6.21                          | 1.13         | 52                       | 6.18                          | 1.10         |
| 1                        | 5.55                          | 0.47         | 27                       | 6.21                          | 1.13         | 53                       | 6.17                          | 1.09         |
| 2                        | 5.88                          | 0.80         | 28                       | 6.20                          | 1.12         | 54                       | 6.17                          | 1.09         |
| 3                        | 6.05                          | 0.97         | 29                       | 6.20                          | 1.12         | 55                       | 6.17                          | 1.09         |
| 4                        | 6.18                          | 1.10         | 30                       | 6.20                          | 1.12         | 56                       | 6.17                          | 1.09         |
| 5                        | 6.25                          | 1.17         | 31                       | 6.20                          | 1.12         | 57                       | 6.17                          | 1.09         |
| 6                        | 6.26                          | 1.18         | 32                       | 6.20                          | 1.12         | 58                       | 6.17                          | 1.09         |
| 7                        | 6.26                          | 1.18         | 33                       | 6.20                          | 1.12         | 59                       | 6.17                          | 1.09         |
| 8                        | 6.25                          | 1.17         | 34                       | 6.20                          | 1.12         | 60                       | 6.17                          | 1.09         |
| 9                        | 6.24                          | 1.16         | 35                       | 6.19                          | 1.11         | 72                       | 6.15                          | 1.07         |
| 10                       | 6.24                          | 1.16         | 36                       | 6.19                          | 1.11         | 84                       | 6.14                          | 1.06         |
| 11                       | 6.24                          | 1.16         | 37                       | 6.19                          | 1.11         | 96                       | 6.13                          | 1.05         |
| 12                       | 6.23                          | 1.15         | 38                       | 6.19                          | 1.11         | 108                      | 6.12                          | 1.04         |
| 13                       | 6.23                          | 1.15         | 39                       | 6.19                          | 1.11         | 120                      | 6.11                          | 1.03         |
| 14                       | 6.23                          | 1.15         | 40                       | 6.19                          | 1.11         | 132                      | 6.10                          | 1.02         |
| 15                       | 6.23                          | 1.15         | 41                       | 6.19                          | 1.11         | 144                      | 6.09                          | 1.01         |
| 16                       | 6.22                          | 1.14         | 42                       | 6.18                          | 1.10         | 156                      | 6.08                          | 1.00         |
| 17                       | 6.22                          | 1.14         | 43                       | 6.18                          | 1.10         | 168                      | 6.07                          | 0.99         |
| 18                       | 6.22                          | 1.14         | 44                       | 6.18                          | 1.10         | 180                      | 6.06                          | 0.98         |
| 19                       | 6.22                          | 1.14         | 45                       | 6.18                          | 1.10         | 192                      | 6.05                          | 0.97         |
| 20                       | 6.22                          | 1.14         | 46                       | 6.18                          | 1.10         | 204                      | 6.04                          | 0.96         |
| 21                       | 6.22                          | 1.14         | 47                       | 6.18                          | 1.10         | 216                      | 6.04                          | 0.96         |
| 22                       | 6.21                          | 1.13         | 48                       | 6.18                          | 1.10         | 228                      | 6.03                          | 0.95         |
| 23                       | 6.21                          | 1.13         | 49                       | 6.18                          | 1.10         | 240                      | 6.02                          | 0.94         |
| 24                       | 6.21                          | 1.13         | 50                       | 6.18                          | 1.10         | 252                      | 6.01                          | 0.93         |
| 25                       | 6.21                          | 1.13         | 51                       | 6.18                          | 1.10         | 264                      | 6.00                          | 0.92         |





| CH2M HILL SLUG TEST DATA |  |  |  |  |  |  |  |  |
|--------------------------|--|--|--|--|--|--|--|--|
| PROJECT NO:              | 117612.G2.F2                             |  |  |  |  |  |  |  |
| CLIENT:                  | MARZONE SUPERFUND SITE - Tifton, Georgia |  |  |  |  |  |  |  |
| TEST DATE:               | 03/13/96                                 |  |  |  |  |  |  |  |
| WELL NO.:                | MW-11D                                   |  |  |  |  |  |  |  |
| COMPILED BY:             | MIKE WEATHERBY/GNV                       |  |  |  |  |  |  |  |
| TEST METHOD:             | SLUG OUT                                 |  |  |  |  |  |  |  |
| ANALYSIS METHOD:         | BOUWER and RICE - Fully Penetrating Well |  |  |  |  |  |  |  |

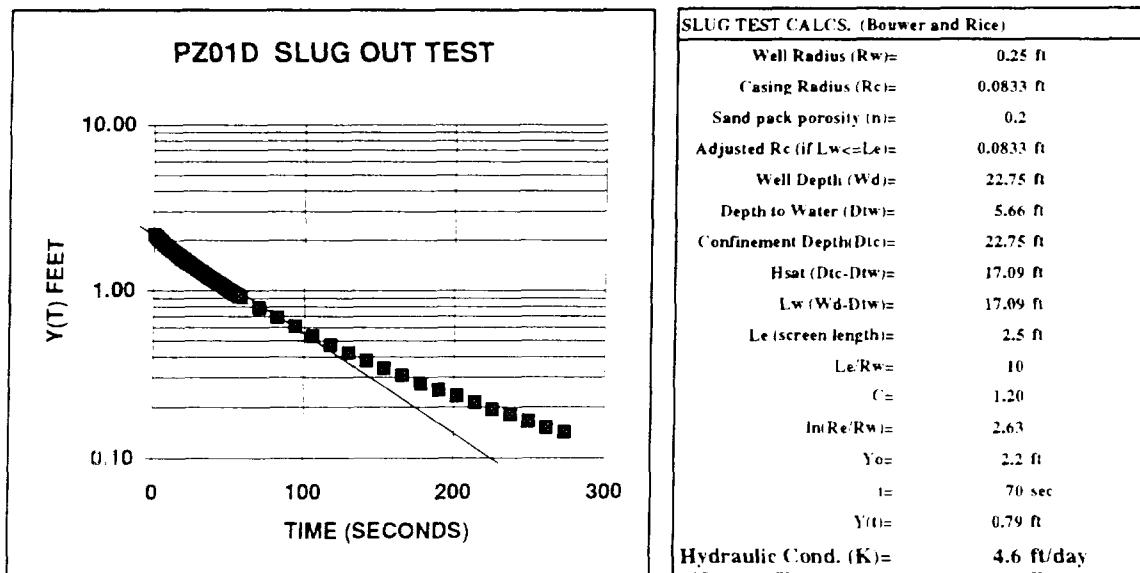
| ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) | ELAPSED<br>TIME<br>(sec) | TRANSDUCER<br>READING<br>(ft) | Y(t)<br>(ft) |
|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|
| 0                        | 5.22                          | 0.00         | 26                       | 7.43                          | 2.21         | 52                       | 7.37                          | 2.15         |
| 1                        | 7.48                          | 2.26         | 27                       | 7.42                          | 2.20         | 53                       | 7.37                          | 2.15         |
| 2                        | 8.30                          | 3.08         | 28                       | 7.42                          | 2.20         | 54                       | 7.37                          | 2.15         |
| 3                        | 7.21                          | 1.99         | 29                       | 7.42                          | 2.20         | 55                       | 7.37                          | 2.15         |
| 4                        | 6.92                          | 1.70         | 30                       | 7.42                          | 2.20         | 56                       | 7.37                          | 2.15         |
| 5                        | 7.11                          | 1.89         | 31                       | 7.42                          | 2.20         | 57                       | 7.37                          | 2.15         |
| 6                        | 7.41                          | 2.19         | 32                       | 7.41                          | 2.19         | 58                       | 7.36                          | 2.14         |
| 7                        | 7.59                          | 2.37         | 33                       | 7.41                          | 2.19         | 59                       | 7.36                          | 2.14         |
| 8                        | 7.61                          | 2.39         | 34                       | 7.41                          | 2.19         | 60                       | 7.36                          | 2.14         |
| 9                        | 7.55                          | 2.33         | 35                       | 7.41                          | 2.19         | 72                       | 7.35                          | 2.13         |
| 10                       | 7.47                          | 2.25         | 36                       | 7.40                          | 2.18         | 84                       | 7.33                          | 2.11         |
| 11                       | 7.44                          | 2.22         | 37                       | 7.40                          | 2.18         | 96                       | 7.31                          | 2.09         |
| 12                       | 7.45                          | 2.23         | 38                       | 7.40                          | 2.18         | 108                      | 7.29                          | 2.07         |
| 13                       | 7.45                          | 2.23         | 39                       | 7.40                          | 2.18         | 120                      | 7.28                          | 2.06         |
| 14                       | 7.46                          | 2.24         | 40                       | 7.40                          | 2.18         | 132                      | 7.26                          | 2.04         |
| 15                       | 7.46                          | 2.24         | 41                       | 7.40                          | 2.18         | 144                      | 7.25                          | 2.03         |
| 16                       | 7.45                          | 2.23         | 42                       | 7.39                          | 2.17         | 156                      | 7.23                          | 2.01         |
| 17                       | 7.45                          | 2.23         | 43                       | 7.39                          | 2.17         | 168                      | 7.22                          | 2.00         |
| 18                       | 7.45                          | 2.23         | 44                       | 7.39                          | 2.17         | 180                      | 7.20                          | 1.98         |
| 19                       | 7.44                          | 2.22         | 45                       | 7.39                          | 2.17         | 192                      | 7.18                          | 1.96         |
| 20                       | 7.44                          | 2.22         | 46                       | 7.39                          | 2.17         | 204                      | 7.17                          | 1.95         |
| 21                       | 7.44                          | 2.22         | 47                       | 7.38                          | 2.16         | 216                      | 7.16                          | 1.94         |
| 22                       | 7.44                          | 2.22         | 48                       | 7.38                          | 2.16         | 228                      | 7.14                          | 1.92         |
| 23                       | 7.43                          | 2.21         | 49                       | 7.38                          | 2.16         | 240                      | 7.13                          | 1.91         |
| 24                       | 7.43                          | 2.21         | 50                       | 7.38                          | 2.16         | 252                      | 7.12                          | 1.90         |
| 25                       | 7.43                          | 2.21         | 51                       | 7.38                          | 2.16         | 264                      | 7.10                          | 1.88         |





| CH2M HILL SLUG TEST DATA |  |  |  |  |  |  |  |  |
|--------------------------|--|--|--|--|--|--|--|--|
| PROJECT NO:              | 117612.G2.F2                             |  |  |  |  |  |  |  |
| CLIENT:                  | MARZONE SUPERFUND SITE                   |  |  |  |  |  |  |  |
| TEST DATE:               | 03/12/96                                 |  |  |  |  |  |  |  |
| WELL NO.:                | PZ01D                                    |  |  |  |  |  |  |  |
| COMPILED BY:             | MIKE WEATHERBY/GNV                       |  |  |  |  |  |  |  |
| TEST METHOD:             | SLUG OUT                                 |  |  |  |  |  |  |  |
| ANALYSIS METHOD:         | BOUWER and RICE - Fully Penetrating Well |  |  |  |  |  |  |  |

| ELAPSED<br>TIME | TRANSDUCER<br>READING | Y(t)<br>(ft) | ELAPSED<br>TIME | TRANSDUCER<br>READING | Y(t)<br>(ft) | ELAPSED<br>TIME | TRANSDUCER<br>READING | Y(t)<br>(ft) |
|-----------------|-----------------------|--------------|-----------------|-----------------------|--------------|-----------------|-----------------------|--------------|
| sec             | ft.                   | ft.          | sec             | ft.                   | ft.          | sec             | ft.                   | ft.          |
| 0               | 7.95                  | 2.29         | 26              | 7.06                  | 1.40         | 52              | 6.64                  | 0.98         |
| 1               | 7.83                  | 2.17         | 27              | 7.04                  | 1.38         | 53              | 6.63                  | 0.97         |
| 2               | 7.77                  | 2.11         | 28              | 7.02                  | 1.36         | 54              | 6.62                  | 0.96         |
| 3               | 7.73                  | 2.07         | 29              | 7.00                  | 1.34         | 55              | 6.61                  | 0.95         |
| 4               | 7.69                  | 2.03         | 30              | 6.98                  | 1.32         | 56              | 6.60                  | 0.94         |
| 5               | 7.65                  | 1.99         | 31              | 6.96                  | 1.30         | 57              | 6.58                  | 0.92         |
| 6               | 7.61                  | 1.95         | 32              | 6.95                  | 1.29         | 58              | 6.57                  | 0.91         |
| 7               | 7.57                  | 1.91         | 33              | 6.93                  | 1.27         | 70              | 6.45                  | 0.79         |
| 8               | 7.54                  | 1.88         | 34              | 6.91                  | 1.25         | 82              | 6.35                  | 0.69         |
| 9               | 7.50                  | 1.84         | 35              | 6.90                  | 1.24         | 94              | 6.27                  | 0.61         |
| 10              | 7.47                  | 1.81         | 36              | 6.88                  | 1.22         | 106             | 6.19                  | 0.53         |
| 11              | 7.44                  | 1.78         | 37              | 6.86                  | 1.20         | 118             | 6.13                  | 0.47         |
| 12              | 7.41                  | 1.75         | 38              | 6.84                  | 1.18         | 130             | 6.08                  | 0.42         |
| 13              | 7.38                  | 1.72         | 39              | 6.83                  | 1.17         | 142             | 6.04                  | 0.38         |
| 14              | 7.35                  | 1.69         | 40              | 6.81                  | 1.15         | 154             | 6.00                  | 0.34         |
| 15              | 7.32                  | 1.66         | 41              | 6.80                  | 1.14         | 166             | 5.97                  | 0.31         |
| 16              | 7.30                  | 1.64         | 42              | 6.78                  | 1.12         | 178             | 5.94                  | 0.27         |
| 17              | 7.27                  | 1.61         | 43              | 6.77                  | 1.11         | 190             | 5.91                  | 0.25         |
| 18              | 7.24                  | 1.58         | 44              | 6.75                  | 1.09         | 202             | 5.89                  | 0.23         |
| 19              | 7.22                  | 1.56         | 45              | 6.74                  | 1.08         | 214             | 5.87                  | 0.21         |
| 20              | 7.20                  | 1.54         | 46              | 6.73                  | 1.07         | 226             | 5.85                  | 0.19         |
| 21              | 7.17                  | 1.51         | 47              | 6.71                  | 1.05         | 238             | 5.84                  | 0.18         |
| 22              | 7.15                  | 1.49         | 48              | 6.70                  | 1.04         | 250             | 5.83                  | 0.17         |
| 23              | 7.13                  | 1.47         | 49              | 6.68                  | 1.02         | 262             | 5.81                  | 0.15         |
| 24              | 7.11                  | 1.45         | 50              | 6.67                  | 1.01         | 274             | 5.80                  | 0.14         |
| 25              | 7.09                  | 1.43         | 51              | 6.66                  | 1.00         | 286             | 5.79                  | 0.13         |



**Water level data, as recorded by the onsite environmental logger,  
are on diskette in Appendix E.**